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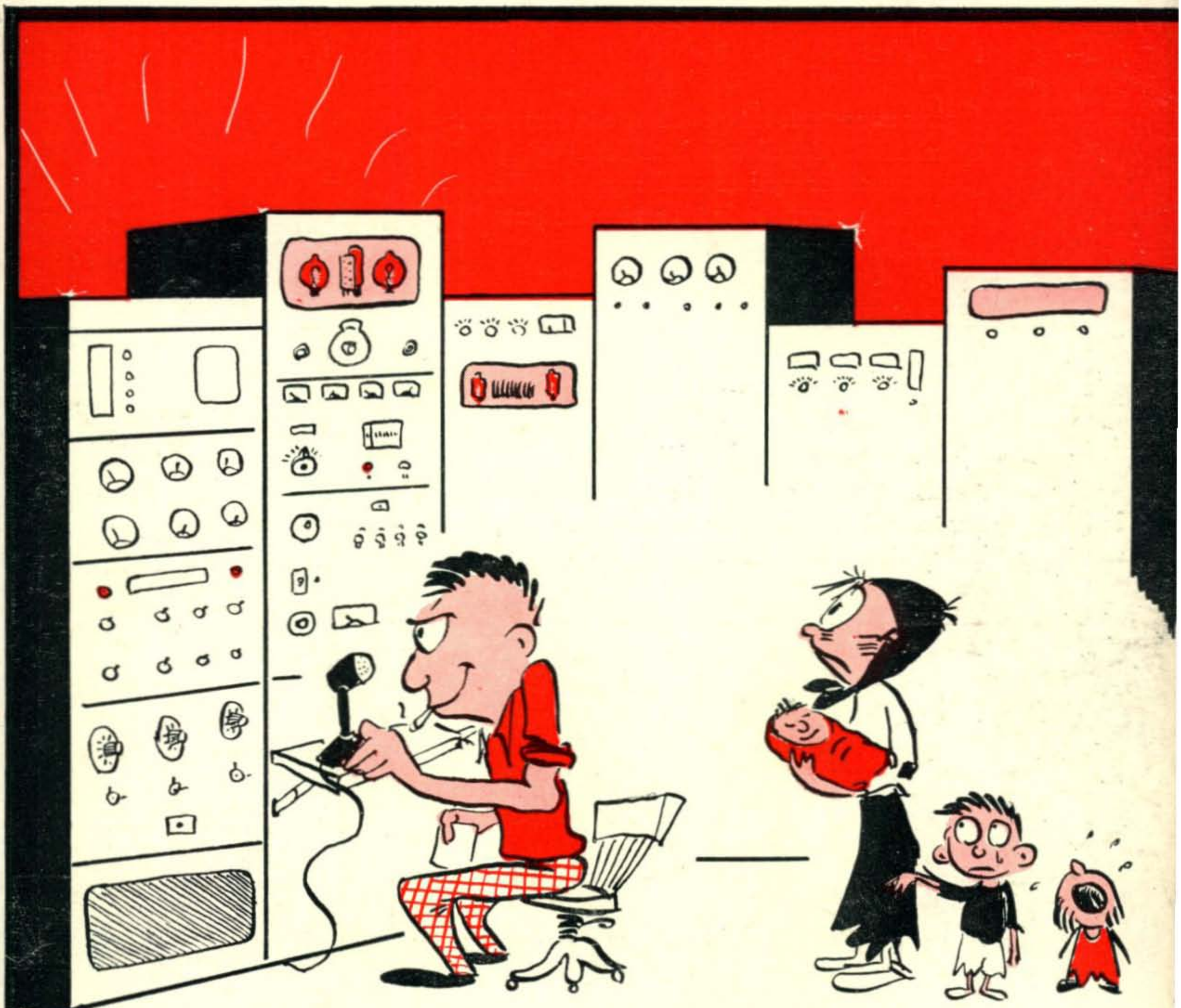
MARCH
1955
35c

CQ RADIO AMATEURS' JOURNAL



In This Issue =

Class B Linear Tips

Really Regulated Supply

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Lustrous satin chrome finish permanently plated on a sturdy zinc alloy case. Beauty that lasts, through years of constant use.

Mobility

It gives any mobile rig the ultimate in convenient operation. Equipped with hook for hanging and bracket for wall or dash mounting. Fits the hand so comfortably it's a pleasure just to cradle it in your palm.

hook for hanging

bracket for wall or dash mounting

True Value

Another Turner microphone tagged for *value*. Engineered for maximum response to voice, and minimum distortion.

TURNER MODEL 90 MOBILE MICROPHONES

SR-90R CARBON: Response: 200-4000 cps. Level: —38 db. Imp: 80 ohm. Switch: DPST-NO for relay and mike control. Cable: attached 4-conductor unshielded 11" retracted Koiled-Kord.

List price: $26.50

SR-90D DYNAMIC: Response: 200-9000 cps. Level: —48 db. Imp: avail. high or 200 ohm. Switch: SPST-NO for relay control. Cable: high imp.: attached 5 ft. 3-conductor, one shielded. 200 ohm imp.: attached 5 ft. 4-conductor, two shielded (balanced line).

List price $29.50

Turner Microphones

THE TURNER COMPANY

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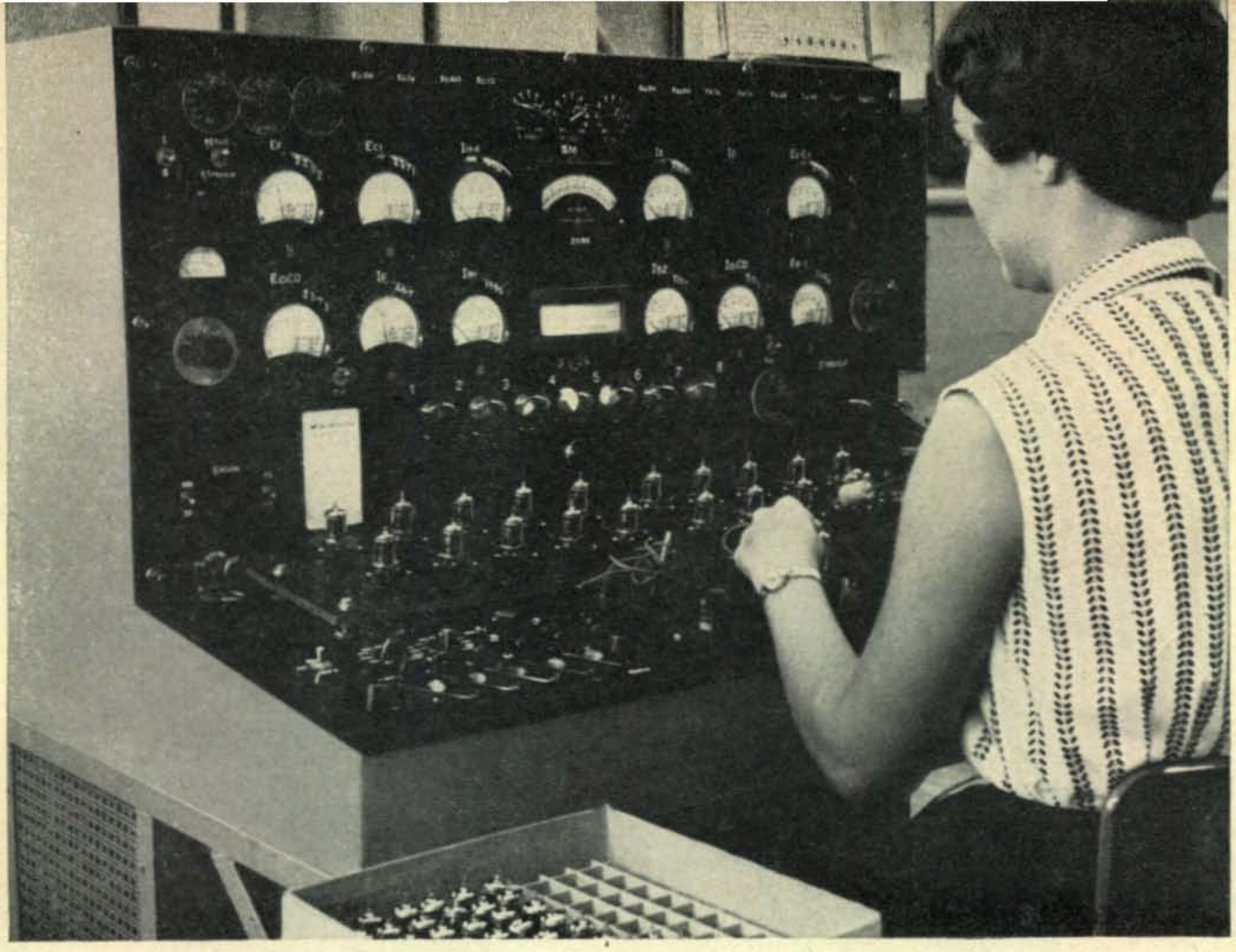

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QUALITY-CONTROL sampling isn't enough—though G-E standards for this lead the industry. *Every* General Electric tube is checked for important operating characteristics.

Instrument dials say if the tube plate current is correct . . . if transconductance equals the prescribed value . . . if no undesirable reverse current flows in the grid . . . if there is no tube short, open circuit, or vacuum leak.

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The tubes your G-E tube distributor sells are the best that precision manufacture, rigid inspection, and thorough testing can produce. Install them with confidence! *General Electric Co., Tube Department, Schenectady 5, New York.*

★ ★ ★

General Electric congratulates the winner of the 1954 Edison Award, Benjamin S. Hamilton, W6VFT, La Mesa, California. The judges named Mr. Hamilton as the amateur whose achievement was most noteworthy, because he provided San Diego County, California, with "an outstanding Civil Defense and disaster-emergency radio network". Recognition given to Award-winner W6VFT and to others whom the judges cited, was equally a tribute to the public-spirited efforts of radio amateurs everywhere.

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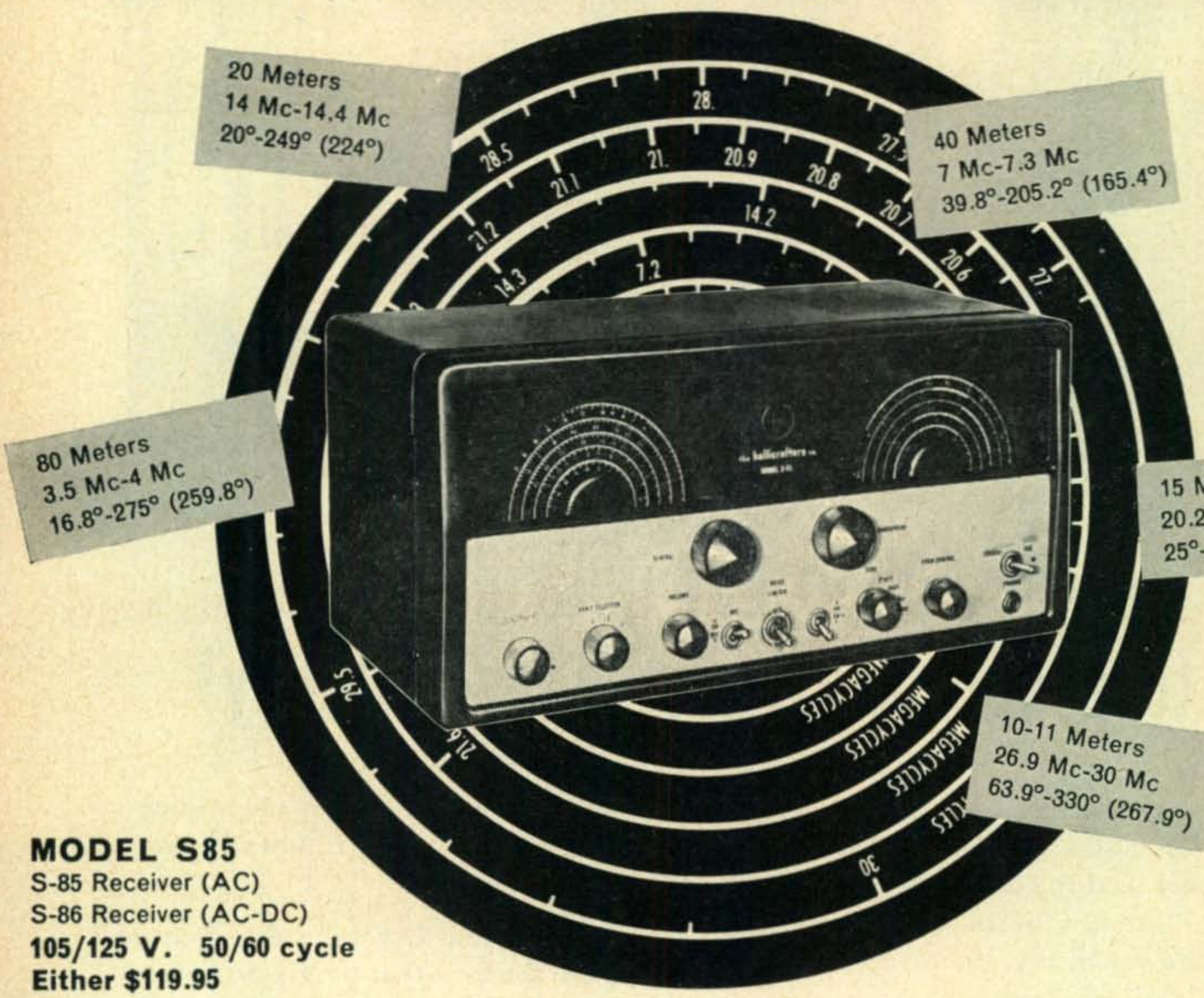
166-1B2

Leading a brand new line...

first with over 1000°

OF CALIBRATED BANDSPREAD!



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S-86 Receiver (AC-DC)
105/125 V. 50/60 cycle
Either $119.95

We know you expect the finest from Hallicrafters and you get it with this exciting new receiver. Here at the "World's Largest Hamshack," we are proud of our new models including the S-85 with the 10, 11, 15, 20, 40 and 80 meter amateur bands calibrated over 1000° for superior selectivity. Broadcast band 540-1680 kc and three short-wave bands 1680 kc—34 Mc are displayed on a large easy-to-read d Separate bandspread tuning condenser, se tubes plus rectifier—there's so much m about this new receiver, why not see y Hallicrafters jobber or mail coupon below complete specification sheet.

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March, 1955
Vol. 11, No. 3

OUR COVER

A characterization from one of the best humorous stories we have seen in a long time, from the pen of Carl Perko, W2GMU/2. For further enjoyment, turn to page 20.

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CQ—(title Reg. U.S. Post Office)—is published monthly by Cowan Publishing Corp. Executive and Editorial offices, 67 West 44th Street, New York 36, N. Y. Phone MUrray Hill 7-2080.
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67 WEST 44th ST., NEW YORK 36, N.Y.

75A-4 RECEIVER

The 75A-4 offers passband tuning, AVC for Single Sideband reception, a bridged T rejection notch filter, a crystal calibrator circuit, separate detectors for double or single sideband signals, a new noise limiter circuit that works equally well on SSB, AM or CW, and mounting provision for three separate Mechanical Filters. Retained are the time-proven features of the earlier 75A series — double-conversion, crystal-controlled first injection oscillator for high stability and good image rejection; permeability tuned, sealed master oscillator with accurate dial calibration and long-term stability, and Mechanical Filters in the IF circuits for maximum selectivity.

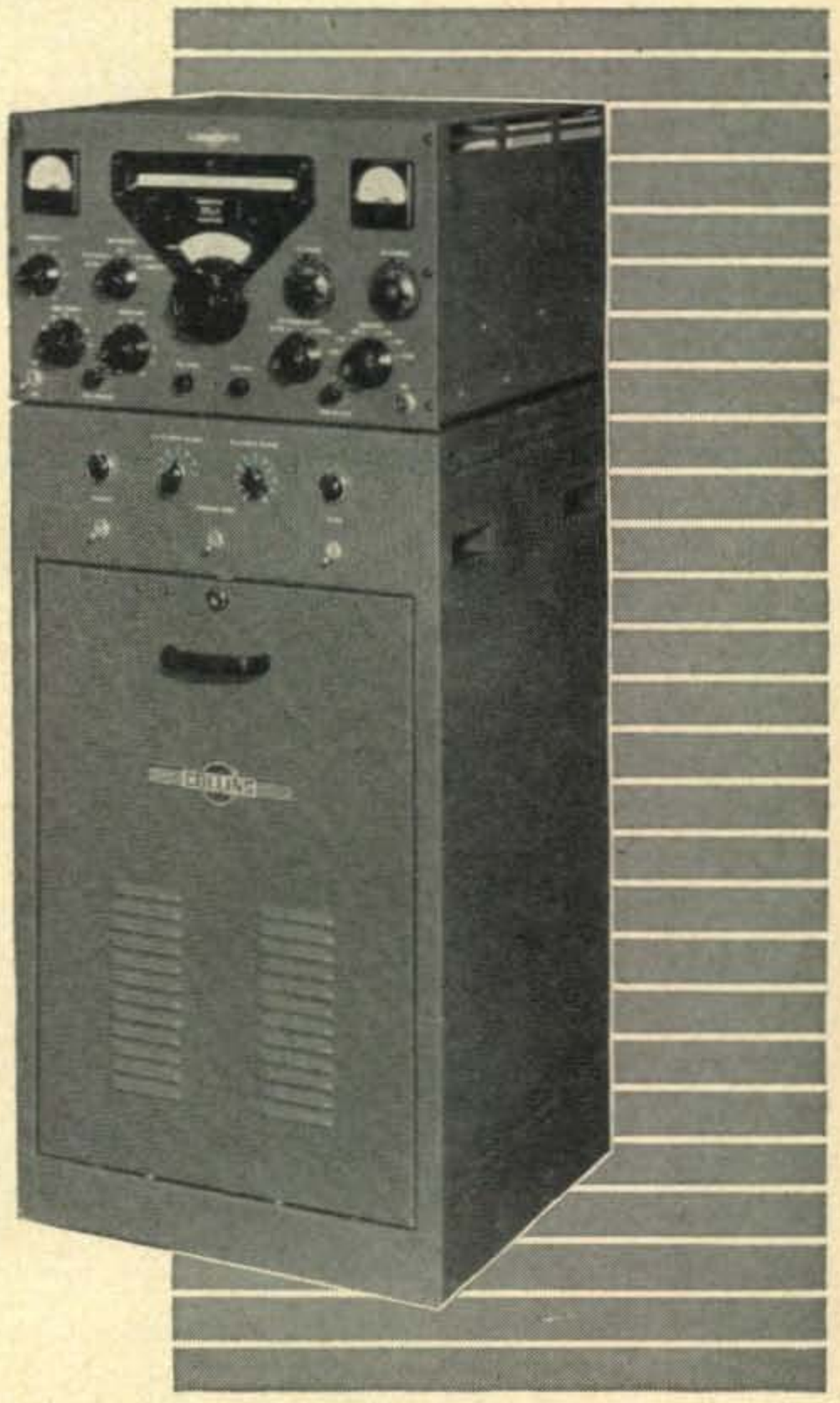
32W-1 EXCITER

Designed to meet the requirements of the most discriminating Amateur whether he operates SSB, AM or CW, the 32W-1 Exciter has sufficient output power to drive a high-level power amplifier stage, and together with the 75A-4 Receiver provides the basic needs for a completely engineered Amateur radio installation. Special features of the 32W-1 are dual conversion, a permeability tuned, hermetically sealed VFO, a Single Sideband generator using the Collins Mechanical Filter to provide optimum rejection of the unwanted sideband, RF feedback to assist in reduction of distortion products, selectable sidebands, bandswitching operation on all amateur bands from 3.5 to 30 mc, VOX or push-to-talk operation, AM operation with full carrier and one sideband being transmitted, CW operation with wave shaping for minimum key clicks and transients, FSK operation by using an external audio FSK oscillator, Automatic Load Control (ALC), and unitized construction.

Collins PROUDLY ANNOUNCES a NEW STANDARD in AM, CW and SSB OPERATION

It took Collins to produce the first really new Amateur communication system, designed expressly for Single Sideband as well as AM and CW operation. Collins new 75A-4 Receiver/32W-1 Exciter or 75A-4 Receiver/KWS-1 Transmitter combinations are designed for the most exacting Amateur. Engineering-wise, the equipment meets the high standards Collins has set for military and commercial equipment. Price-wise, the Amateur will get more for his money than ever before. See your nearest Collins distributor for your brochure.

KWS-1 TRANSMITTER



Collins engineering plus extensive on-the-air tests account for the KWS-1 Transmitter's reliability and optimum performance in SSB, AM and CW operation. The exciter and RF power amplifier are housed in a single receiver size cabinet. The Collins 367A-1 linear RF power amplifier uses two 4X150A's in class AB operation. RF feedback is employed to improve the linearity characteristics of the power amplifier. The KWS-1 incorporates circuit application and components which have been proved in preceding Collins equipment; to note a few, the 70E VFO, the Pi-L output network, extremely accurate VFO dial and the Collins Mechanical Filters. To meet the Amateur's future desire for power increase, Collins 32W-1 Exciter can be modified to a KWS-1 at the factory.

COLLINS RADIO COMPANY
Cedar Rapids, Iowa

261 Madison Avenue, NEW YORK 16
1930 Hi-Line Drive, DALLAS 2
2700 West Olive Avenue, BURBANK
Collins Radio Company of Canada Ltd.
74 Sparks Street, OTTAWA, ONTARIO

COLLINS

Designed for

Application

The No. 90801

EXCITER-TRANSMITTER

The No. 90801 Exciter-Transmitter is of the most modern design including features and shielding for TVI reduction, band-switching for the 4-7-14-21 and 28 megacycle bands, circuit metering. Conservatively rated for use either as a transmitter or exciter. 5763 oscillator-buffer-multiplier and 6146 power amplifier. 90 watts input for CW. Can be keyed in the oscillator and/or amplifier or by means of keyed external V.F.O. such as the 90711. 67 watts input phone. Rack mounted 3½" panel height.

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS

Feenix, Ariz.

Deer Hon. Ed:

Scratchi are just being thru an eggspearyance that shudent happening. Not just wun that shudent happening to a dog—this eggspearyance just shudent happening period. Hon. Ed., I knowing you thinking that Scratchi now and then are stretching trooth a bit now and then like, but what are just happening to me are reely honest to goodness trooth and no kiddings. There was Hon. Brother Itchi, just covered with . . . oops, I are getting ahed of story.

Resently I deciding it are to easy to working stayshuns with my big rig, so I thinking it be nice to having small low power rig. You knowing what I meening, Hon. Ed., it are giving good feeling inside to QSO'ing fellow few thousand miles away when only using ten whats or so, espeshyoually if this are on fone.

So, Scratchi are bilding foney rig. Just a cupple of toobs, bilt in small case, and using speshul circut I finding in sum radio artickle to modulating final. When soddering last wire in place are taking rig to workbench and testing it. Boy oh boy, it are working like eleventeen millyun bux. Using old Xmas tree bulb and practikally burning it out with soop from final tank.

Checking modulayshun on ohsillyscope and getting peechy results. Well, ackshewally getting sum funny traces on toob which aren't figuring out, but in general are having 1/c modulayshun hundred percent.

Next, like any normal amchoor, I rushing with newly cumpleeted rig to Hon. Shack, finding dangling lead-in wires from forty meter long wires antenna, and hooking rig to antenna. Plugging in mike, turning on power, and calling seek-you—a reel snappy five-minute wun. Checking across band, finding nobuddies calling me. Trying another seek-you. Still no luck.

Tightening all conneckshuns, looking at plate current meter, everything seeming to be in 1/c shape. Trying seek-you again. No dicey. Well, deciding I'd better finding answer to trubble. Grabbing trusty feeld strength meter, turning on rig, and going outsides to checking feeld strength.

Hokendoke!! Big trubbles. No feeld strength!! Walking all over the place, and not finding signals anywhere. After abouts fifteen minutes are reddy

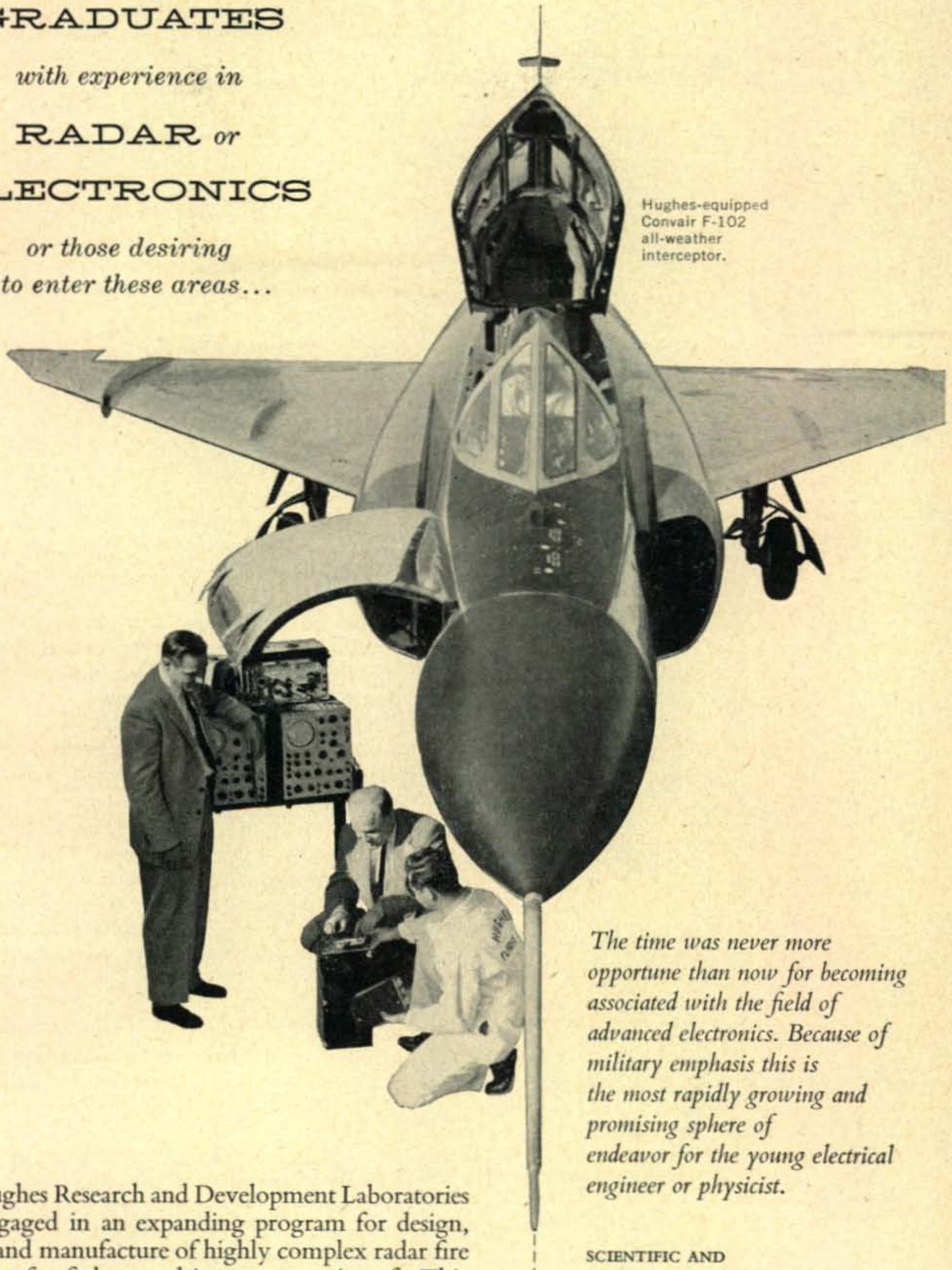
[*Continued on page 8*]

E. E. *or* PHYSICS GRADUATES

with experience in

RADAR *or* ELECTRONICS

or those desiring to enter these areas...



Hughes-equipped Convair F-102 all-weather interceptor.

The time was never more opportune than now for becoming associated with the field of advanced electronics. Because of military emphasis this is the most rapidly growing and promising sphere of endeavor for the young electrical engineer or physicist.

Since 1948 Hughes Research and Development Laboratories have been engaged in an expanding program for design, development and manufacture of highly complex radar fire control systems for fighter and interceptor aircraft. This requires Hughes technical advisors in the field to serve companies and military agencies employing the equipment.

As one of these field engineers *you will become familiar with the entire systems* involved, including the most advanced electronic computers. With this advantage you will be ideally situated to broaden your experience and learning more quickly for future application to advanced electronics activity in either the military or the commercial field.

Positions are available in the continental United States for married and single men under 35 years of age. Overseas assignments are open to single men only.

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HUGHES

RESEARCH AND DEVELOPMENT LABORATORIES

Culver City,
Los Angeles County,
California

Relocation of applicant must not cause disruption of an urgent military project.

Heathkit
GRID DIP METER KIT

MODEL GD-1B

$19.50 Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasities, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1¼ meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at $3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

Heathkit
ANTENNA COUPLER
KIT

MODEL AC-1

$14.50 Ship. Wt. 4 lbs.

The new Heathkit Antenna Coupler Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any transmitter not exceeding 75 watts RF input power. Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects to a three section Pi- type low pass filter with a cut-off frequency of 36 Mc. Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit. Capacity coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.

Heathkit IMPEDANCE
METER KIT

MODEL AM-1

$14.50 Ship. Wt. 2 lbs.

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and resonant frequency and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0–150 Mc and range of impedance measurements 0–600 ohms. The circuit uses a 100 microampere Simpson meter as a sensitive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

HEATH COMPANY
BENTON HARBOR 12, MICHIGAN

[*from page 6*]

to calling it a day, when all of suddens sumthing goes Swithh!! past my ear, then sumthing else goes Whisttt!!! over top of my hed. I looking up, and, Hon. Ed., it are cutest thing. To bats are flying back and forth over house and over me, turning and twisting like sixty.

Next things I knowing, are lots of more bats all around. They getting thicker, and thicker and thicker. I deciding Hon. Brother Itchi ought to seeing this, so going in house and getting him. He cuming out and we sitting down to watching. Are millyuns of bats, and all seem to be cuming from direckshun of mountens, and they all buzzing our roof when getting here. They perching all over house, trees, cacktus, and finally getting so thick they perching on Brother Itchi and me. At this points we going in house.

When inside I remembering that little foney rig still on air, so going in shack to turning it off. I no sooner throwing switch than I heering noise like twenty gillyun wagon wheels all squeaking at wunce. Turning set on again—noise disapeering.

Set on—everything quiet. Set off—bedlems braking loose. Sacremento Bullyvard!! Idea cuming to Scratchi. Did new Hon. Foney Rig bringing all thees bats?? Quicklike checking lead-in wires rig are conneckted to. Holey Smokes. Not hooked to 40 meter long wire antenna. Rig hooked to new UHF tellyvision antenna in attic.

Hon. Ed., I knowing that peeple beeting path to door of man with better mousie-trap, but who heering of bats beeting path to door when man inventing better amchoor rig. Aren't finding that happening much nowadays.

I rushing to living room and telling Hon. Brother Itchi I thinking new rig are cawsing trubbles. He thinking for cupple minnits, then saying why nots taking rig out in desert and trying it outs—if bats cuming to spot where rig is, everything hunky-dunky.

Good idea, Scratchi thinking, but wun problem. If turning off rig, bats making so much squeaking noise nobuddies can heering. If bilding new foney rig, to enticing bats away from house, maybe not being same as present rig, and maybe not working. You see, Hon. Ed., I deciding that foney rig are putting out ultrasonics signal from modulayshun circuit which are sounding like females bats or bat in trubble, hence reason for all bats cuming to my house.

Finally cuming to conklushun only way to lure bats from house is using self-same rig. So, working like sixty and making power supply to working from six volt battery. Borrowing Brother Itchi's car battery (Hee, hee, that teaching him!!) and everything reddy. Quicklike changing antenna to spare UHF Batwing antenna I having (Hon. Ed., could it be that . . . no, no, that's too silly). Next changing power supply, and there are having new foney rig, still working, with portable antenna and power supply.

Scratchi rushing out to jeep, putting rig in back, and zooming out a across countries. Bats are fol-

[*Continued on page 60*]

New Heathkit VFO KIT

MODEL VF-1

$19.50

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.

Smooth acting illuminated dial drive.

Open layout,— easy to build — simplified wiring.

Clean appearance — rugged construction — accessible calibrating adjustments.

Ceramic coil forms — differential condenser.

Copper plated chassis—careful shielding.

Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

$29.50

Ship. Wt. 16 lbs.

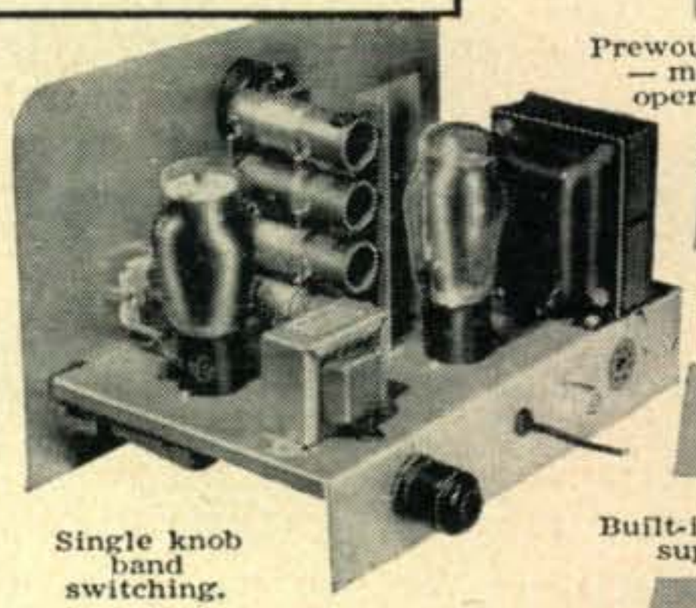
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G ..... Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils — metered operation.

Rugged, clean construction.



52 ohm coaxial output.

Built-in power supply.

Single knob band switching.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Heathkit COMMUNICATIONS RECEIVER KIT

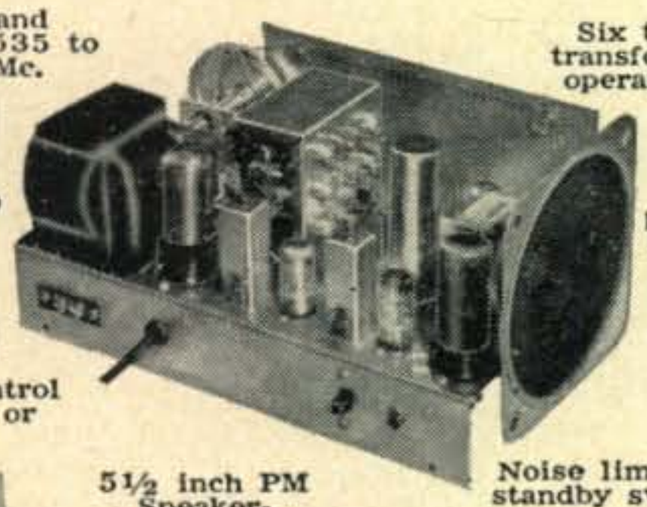
Four band operation 535 to to 35 Mc.

Six tube transformer operation.

Stable BFO oscillator circuit.

Electrical bandspread and scale.

RF gain control with AVC or MVC.



5½ inch PM Speaker-Headphone Jack.

Noise limiter—standby switch.

SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....B. F. O. oscillator
12A6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A. C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY

BENTON HARBOR 12, MICHIGAN

Eimac designed*; Eimac produced ...for Eimac QUALITY

Included in the incomparable list of Eimac developed electron-power tubes, which range to 9600mc and 25 kw power output, are six favorites of Amateur Radio Operators. Application-proved in many types of commercial and military service, the 4-65A, 4-125A, 4-250A, 4-400A and 4X150 radial-beam power tetrodes and 4E27A radial-beam power pentode possess the inherent features of Eimac multi-grid tubes—high power gain, minimized neutralization needs, and on-the-air economy. Mobile or shack, 2mc or 420mc, CW or phone, there's a tube in the Eimac Amateur's Big Six to do the job for you with a wallop. When visiting your distributor ask for Eimac—the mark of excellence in electron-power tubes.

Write our Amateur Service Bureau for further information.

*Eimac developed electron-power tubes

4-65A	75TL
4-125A	100TH
4-250A	100TL
4-400A	152TH
4-1000A	152TL
4PR60A	250TH
4W20,000A	250TL
4X150A	304TH
4X150D	304TL
4X150G	450TH
4X500A	450TL
4X500F	592/3-200A3
4E27A/5-125B	750TL
3K20,000LA, F, K	1000T
3K50,000LA, F, K	1500T
3W5000A3	2000T
3W5000F3	2-25A
3W10,000A3	2-50A
3X2500A3	2-150D
3X2500F3	2-240A
3X3000A1	2-2000A
3X3000F1	250R
25T	253
35T	8020(100R)
35TG	KY21A
75TH	RX21A

Eimac TUBES

EITEL-McCULLOUGH, INC.
SAN BRUNO, CALIFORNIA

FREE FREE FREE FREE FREE FREE FREE

FREE

Sure, chum, it's free, as long as you pay for it. In other words, always look a gift horse in the mouth. Let me tie that one down to ham radio so you can grab my thought. Take modulation for instance. Show me the phone man that doesn't take interest when the story goes around about some new form of modulation that uses a little bitty tube to modulate a whole kilowatt. Though I haven't been through the spark days of radio I have lived successfully through the enthusiasms of grid modulation, cathode modulation, screen modulation, suppressor grid modulation, narrow-band f-m, and super modulation. From the present vantage point in years we can see that each of these modulating methods has balancing good and bad features. What you gain in using less equipment you lose in efficiency. Somehow it is comforting after all these years and all of the flurries to find that good old class B is still accepted as the standard.

So it is with antennas. We are always ready to believe that some new antenna is really "it." You perhaps can remember some of the stories that went around ten meters a few years back about the bi-square beam. And the underground antennas.

What am I trying to prove? Well, mainly I wanted to get an idea across. A basic law of physics, the law of conservation of energy, says that you don't get something for nothing. This is pretty well accepted in science. A person's acceptance of it in humanics is pretty much a measure of his maturity. Let me cite the genius/perspiration quotation in support of this. You can muster up lots more evidence if you want, but I'd rather get down to an amateur radio application of the law.

To put it simply, if you want to be outstanding you darned well have to work for it. The top VHF men of the world got there all the same way: they took a lot of pains to build good equipment, both transmitters and receivers, they put up good antennas in good locations, usually on high towers. If you doubt it just take a look in on any of the top listed VHF men yourself. I've visited a few. W8UKS has a tower that has to be seen to be believed. It is no wonder he has such an impressive list of DX worked on all bands. Even on 75 meters he can work South Africa with a thirty watt phone rig. Sprouting all around the top of the tower are the 144, 220, and 420 Mc beam antennas. Below that come the ten and twenty meter beams.

Sure, you can work DX now and then with lower power and a fairly simple antenna, but if you want to rub shoulders with the WAZ boys you have to get a hustle on. That takes power, antenna, operating ability and unlimited perseverance.

There are a lot of us that would like to be outstanding in our particular phase of ham radio, whether it be DX'ing, VHF, SSB, RTTY, Traffic Handling, CD, or rag chewing. The simple recognition that success in any of these fields can result only from hard work will help both you and the rest of us. I am tempted to editorialize right here and now on the present quality of rag chewing, but let's stay friends for another month. You may say, "But this is a hobby, I don't want any hard work." That thought is easy to squash . . . just take a look at any sport and you will see more clearly that the more you learn about something the more fun you can have with it. This is true in Ping Pong, Tennis, Swimming, Skin Diving, Horseback Riding, Fencing, Skiing, and in ham radio too.

Now to the part that *CQ* can play in this. The main purpose of *CQ* is to act as a communication center for information about amateur radio. In this way the things that interest one fellow or group can be brought to the rest of the gang and they can also enjoy them. Thus when you design something new, be it a transmitter, receiver, test equipment, remote control, etc., there are a lot of others that would like to have the fun you have had in building the device and in using it. The limitations I have in bringing you these articles are the small percentage of hams that go to the trouble to write up their developments and the number of pages available in the magazine.

I am letting out no secrets when I reveal that the number of pages available for articles is controlled by the amount of advertising that is in the magazine. When you look through the ads in *CQ* you are doing more for paying for the magazine than in the subscription price, which largely covers the cost of handling and mailing. Every time we manage to get a few more advertisers we can run more pages in the book and have that many more articles.

It is always well to end up on a note of action. Implicit in the preceding is the call for more articles. If you have any ideas that your friends agree would make a good article drop me a note and tell me about it. Don't worry if you can't write well, we have several staffers that can whip your data into reasonable shape. So, what have you got? As one last prod I might remind you that *CQ pays* for all articles published.

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the ARC-5 repackaged

Fig. 1. The *Commercial Look* for inexpensive surplus receivers.

W. B. Bernard, CDR., ED, USN, K6EUS

The ARC-5 receiver units are extremely handy around any ham shack. They are inexpensive, plentiful and require so little power for operation that they can be used as standby receivers, monitors for net channels, autocall service, and dozens of other purposes.

Most of us admire the neatness of commercial communications installations and their ability to stack a large quantity of the essential gear in "package" form by relay rack style of construction. More and more amateur stations are adopting this space-saving feature. The reworking of the popular ARC-5 series of receivers into the form shown here permits realization of that dream of all amateurs: a separate receiver, optimized for each band worked.

The ARC-5 units are, as originally packaged, fairly unhandy from many aspects: they clash with the decor of the shack, are difficult to hold in place while tuning, and require an external power supply. For many uses it is desirable to add another audio stage and a noise limiter. At any rate, the solution is one of repackaging.

The receiver repackaged in this case was the one which covers the .19-.55 Mc. band. Since it was to be used as a Q-5'er it was considered very desirable to add an additional audio stage and a noise limiter so that once the i-f signal was removed from the communications receiver it did not need to be returned for either audio amplification or noise limiting. These changes are useful even if the receiver is only used as a stand-by receiver.

If you do not have available a Handbook of Maintenance Instructions for the receiver it is strongly recommended that wiring diagrams be made of all the coil sockets before the old receiver is disassembled.

Fig. 1 is the front view of the repackaged ARC-5. It is mounted back of a 3½-inch rack panel. The components are mounted on a 4x17x3-inch chassis as shown in *Fig. 2*. A 5x17x3-inch chassis would have been preferable in some ways but no chassis of this size was available on the local market at the time the conversion was done so we just squeezed things up a little bit more. Even so, it did not turn out to be unduly crowded.

The components of the ARC-5 were removed from the original chassis and then the chassis was cut into parts which held the coil sockets and the mounting studs for the coils. The r-f, mixer and oscillator coil sockets were removed

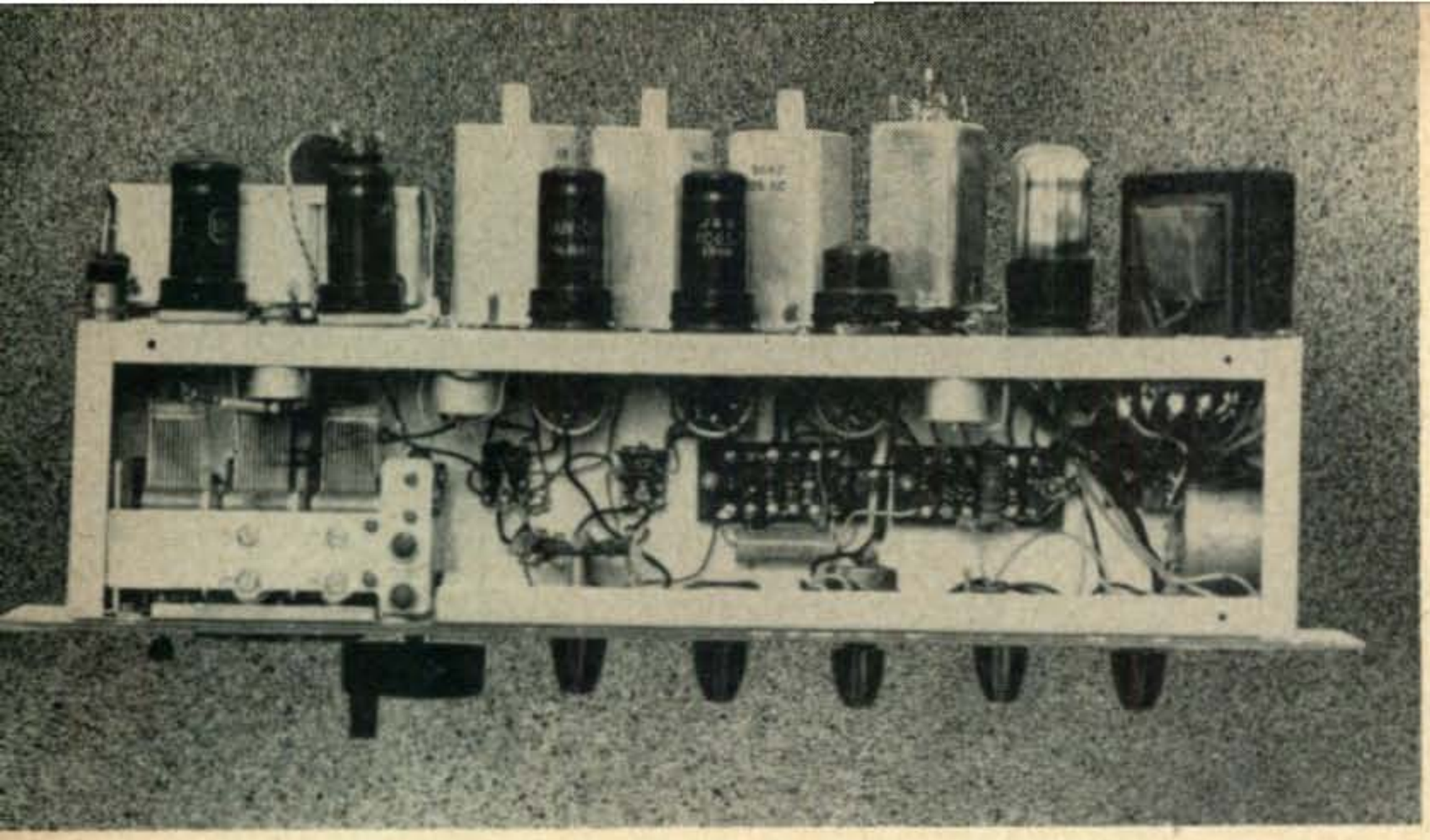


Fig. 2. Wiring under the chassis is kept simple if a parts layout like this is followed.

as a group of three and enough of the sides of the chassis was retained to allow the coils to be held by the screws, as was the case in the original instruction. Each of the i-f coil sockets was cut out along with enough of the chassis to hold the mounting studs and to permit the mounting of the socket to the chassis with four screws. An octal socket was placed next in line to hold the b-f-o coil which in the original receiver was not of plug-in construction. *Fig. 3* shows the back view of the new chassis with all the coil sockets mounted.

Fig. 4 shows the back of the chassis with all the coil installed. All the coils are from the original ARC-5 except the b-f-o coil which was missing from the receiver when it was purchased.

The circuit of the receiver was revised slightly to permit operation from a 120-volt d.c. plate supply. 6 volt tubes are used in this receiver since it had already been converted to 6-volt operation; however 12 volt tubes may be used if a power transformer with a 12-volt heater winding is installed or if a 6.3-volt filament transformer is connected in series with the heater winding of the type transformer used in this conversion. The revised circuit of the receiver is given in *Fig. 6*. The ARC-5 components which are re-used are not numbered on the diagram, making it a simple matter to distinguish the new parts needed. Since the second i-f amplifier operates at a fixed gain a 6SJ7 was substituted for the 6SF7 in order to save plate current. This made it necessary to get the a-v-c voltage from the second detector load resistor. This receiver was not designed for high-fidelity so there is no disadvantage to this change; however, after completing the conversion it was found that a reserve of plate current was available so the original second IF amplifier tube and the original AVC circuit could have been maintained.

The early stages of the receiver are little changed. In order to operate a 120-volt d.c. supply the screens and plates are fed from a single source, thus saving some decoupling resistors and associated by-pass capacitors. It was of course necessary to provide an RF gain control and it was also considered desirable to

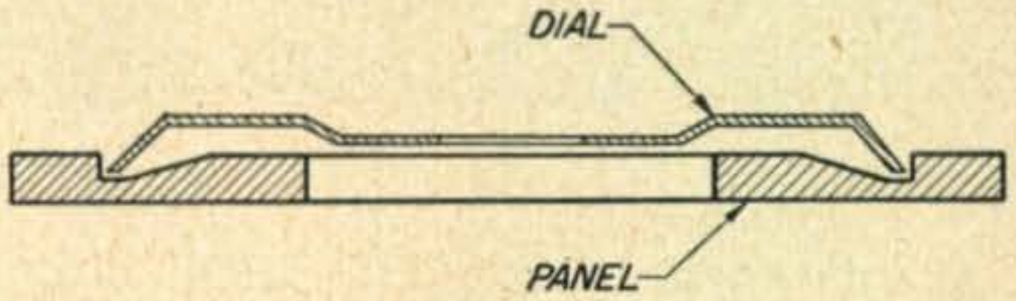
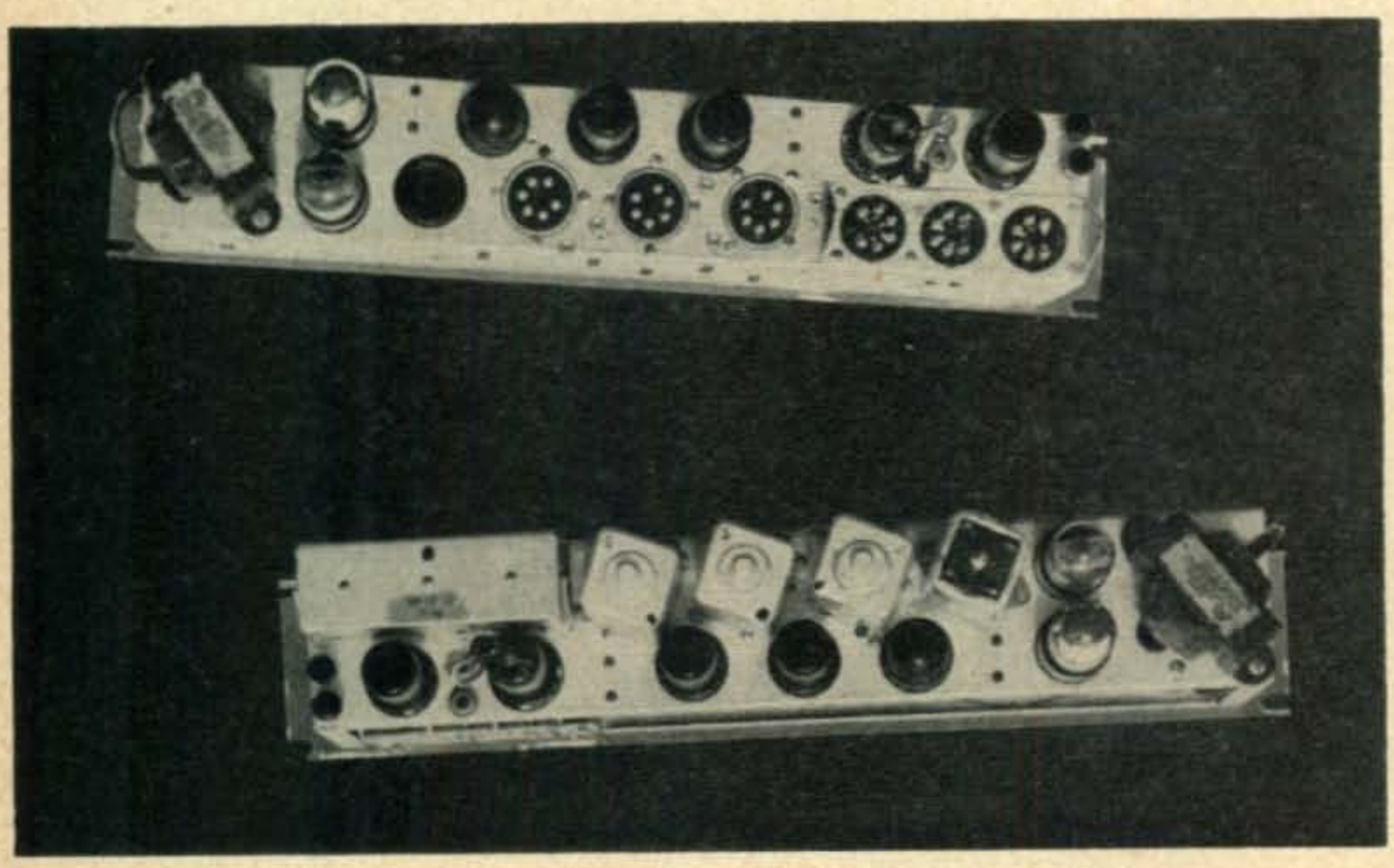


Fig. 5. Cross section of the recessed panel cut back to fit ARC-5 dial. Panel may be cut all the way through if you want to save some energy.

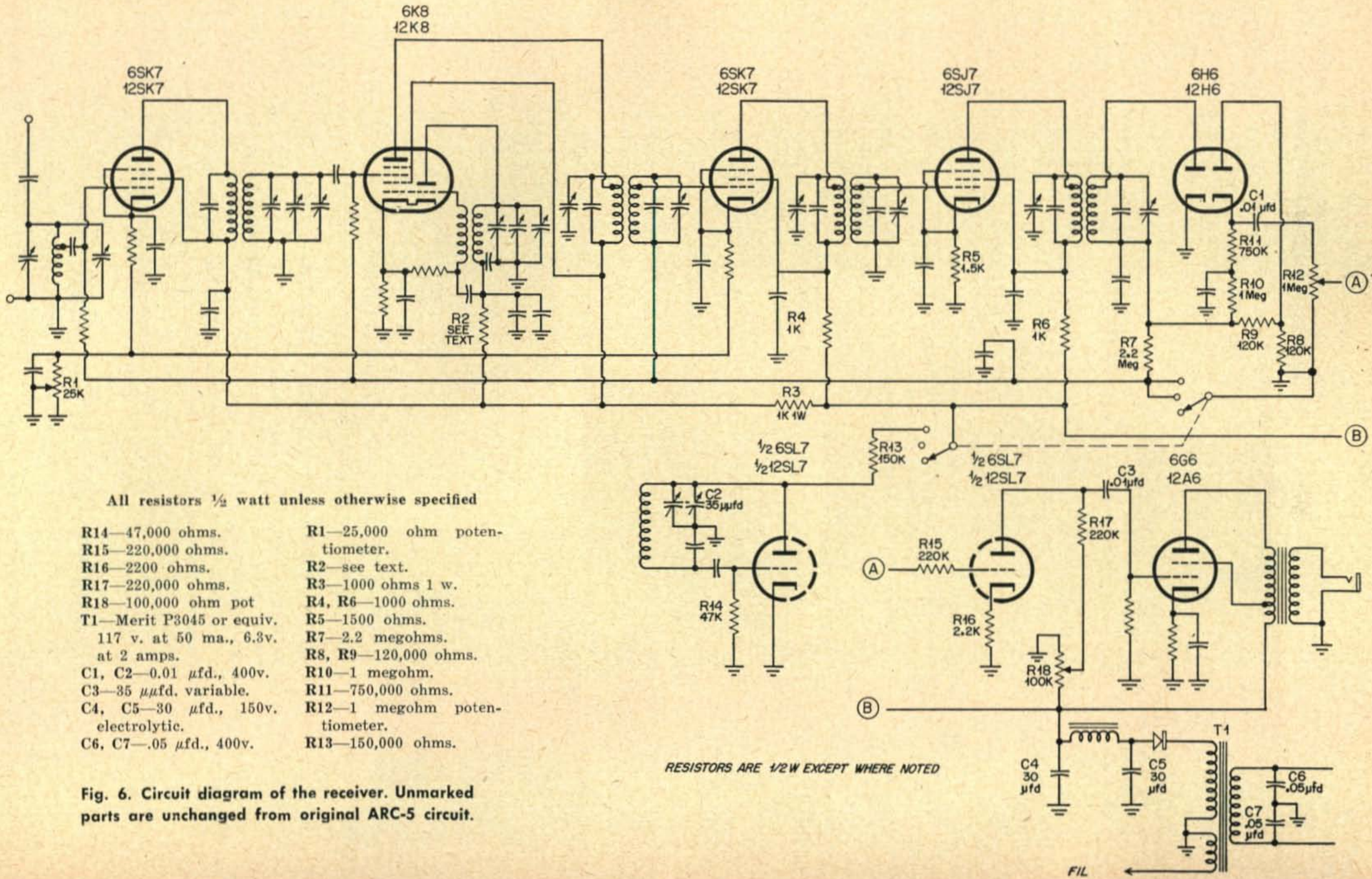
parallel the oscillator plate dropping resistor inside the coil shield with another one *(R2)* across the coil socket terminals. *R2* should be half the value of the resistor inside the coil shield.

One-half a 6H6 is used for the second detector and a-v-c rectifier and the other half is used for a series noise limiter diode. A 6SL7 is used as the first a-f amplifier and the b.f.o. The plate voltage of the audio section of the

[*Continued on page 16*]



Figs. 3 & 4. The position of the i-f and r-f plug-in strip sockets can be seen here.



All resistors ½ watt unless otherwise specified

R14—47,000 ohms.
R15—220,000 ohms.
R16—2200 ohms.
R17—220,000 ohms.
R18—100,000 ohm pot
T1—Merit P3045 or equiv. 117 v. at 50 ma., 6.3v. at 2 amps.
C1, C2—0.01 µfd., 400v.
C3—35 µµfd. variable.
C4, C5—30 µfd., 150v. electrolytic.
C6, C7—.05 µfd., 400v.
R1—25,000 ohm potentiometer.
R2—see text.
R3—1000 ohms 1 w.
R4, R6—1000 ohms.
R5—1500 ohms.
R7—2.2 megohms.
R8, R9—120,000 ohms.
R10—1 megohm.
R11—750,000 ohms.
R12—1 megohm potentiometer.
R13—150,000 ohms.

Fig. 6. Circuit diagram of the receiver. Unmarked parts are unchanged from original ARC-5 circuit.

K6EUS, despite the implied newness of the "K" call, has been licensed since 1937. Originally W4ELZ, then W3LWX, W1QUR, and now K6EUS. This is what happens when you are in the Navy. Prefers six and ten meters. Hamming consists more of design, construction and experimentation than anything else. Commander Bernard is now the Executive Officer of the Navy Electronics Laboratory at San Diego and a Senior Member of the I.R.E.

6SL7 is made variable so that the tube may be operated as a saturated amplifier and thus act as an additional noise limiter. A 6G6 is used as a second audio amplifier. This tube was selected for its low heater current. A 6AK6 miniature output pentode could have been used or, if 12-volt tubes are used, the original 12A6 could be used. The screen of the 6G6 is fed from the tap on the primary of the output transformer to give some inverse feedback which reduces the output impedance of this stage and limits the voltage developed across the output transformer.

The power supply is a conventional half wave rectifier system employing a small transformer of the type used in audio pre-amplifiers or television boosters.

A few tricks were resorted to in order to use the 4-inch wide chassis instead of the 5-inch wide chassis for which the design was originally planned. It was originally planned to mount the tuning capacitor about ¾ inch behind the panel with the dial to be viewed through a window in the panel. Using the 4-inch chassis it was necessary to mount the capacitor right against the panel so the chassis flange had to be cut away as shown in *Fig. 2*. The panel had to be machined away to allow room for the dial as shown in *Fig. 5*. This machine work was done with a circle cutter the tool of which was ground to a slighter angle.[1] As may be seen from *Fig. 2*, the by-pass capacitor directly behind the tuning capacitor had to be mounted with its mounting studs sticking through the rear of the chassis. The antenna trimmer capacitor was mounted inside the first section of the tuning capacitor. The space there was a little crowded also so it was necessary to file off the bottom rear corners of the trimmer stator rods. Once these little mechanical details were arranged the project went forward at a good pace.

After the receiver was tuned up it was found to overload on strong stations when using avc and maximum r-f gain. An investigation showed that we were "fortunate" enough to have selected leaky 0.05 μfd sections for both of the avc line capacitors so they were replaced with a tubular capacitor alongside one of the terminal boards. Other constructors may profit by this easily avoided mistake and reserve the leakiest capacitors for the cathode by-pass function where a leakage resistance of 2 or 3 megohms is of no importance.

As stated previously, this conversion was planned to use the original ARC-5 parts wherever possible. A relaxation of this policy would have permitted further saving of space, for instance most of the bypass capacitors could have been located directly on the tube sockets and the remaining ones could have been terminal boarded. Miniature tubes could have been substituted for the metal tubes in which case the IF transformers could have been mounted square with the chassis and moved further to the left leaving more room for the power supply components at the right hand end of the chassis.

Regardless of whether the constructor wishes to follow exactly the instructions given in this article or wishes to give a more complete or less complete treatment to his receiver, the ARC-5 need not remain an ugly duckling. Repackage it!

1. Editor's note: The use of an aluminum panel instead of steel should materially ease the job of recessing the dial into the panel. Some may consider it simpler to merely cut out a circular opening in the panel slightly larger than the dial itself.

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Elements of Radio, Third Edition, by A. Marcus and Wm. Marcus. 771 pages, $6.00.

This is a new and revised edition of the book that many of us used to learn about radio. This simple, understandable, thorough and well illustrated work is designed for students of basic radio and electricity. It is carefully laid out to go step by step through the development of the art and is complete with questions and problems to allow you to actually use the things you have learned. The book is slanted toward practical radio and leaves to the engineering student the more complex formulas and mathematical treatment of radio. Most Amateurs would do well to have such a text book on his shelf.

Dayton Hamvention April 2nd

The Dayton Amateur Radio Association is sponsoring the fourth annual Dayton Hamvention at the Dayton Biltmore Hotel, April 2nd. The all-day affair, starting at 8 AM, will feature many well known speakers and will conclude with a banquet at 7 PM. Tickets are available from the D.A.R.A., Box 44, Dayton 1, Ohio, in advance for $5.00, fifty cents more at the door. FCC exams will be given and there will also be an exhibition of amateur equipment. Prizes by the dozens. Coming? . . . . W G

linear TIPS

Norman R. McLaughlin, W6GEG

Many of us have at one time or another at least wanted to experiment with running the final in Class B. Here are the basics involved in such a venture.

Many newcomers to single sideband suppressed carrier transmission, and some old timers as well, look with awe upon Class B Linear Amplifiers. They have become quite a topic of conversation because they are a must if output from SSB exciters is to be increased with any efficiency.

Up until just recently, use of linear amplifiers has been restricted almost exclusively to commercial applications. Until the advent of SSB there has been little offered by linear amplifiers to interest the amateur.

The double sideband AM phone man saw no percentage in a linear amplifier. With 1000 watts into the linear he would be mighty lucky if he could get 400 watts out. The CW man saw no point in running his final Class B when higher efficiency could be obtained from the same tube with the same input but operated at Class C.

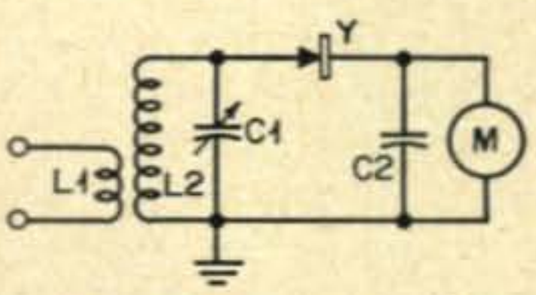
Now that amateur phone bands are becoming increasingly populated with SSB signals, Linear Amplifiers are coming into their own. In addition to Class B Linears are Class AB_1 and Class AB_2 Linears. To keep matters simple, however, we will confine these remarks to Class B Linears.

About the first question that usually arises is "How much bias?" Theoretically, Class B bias is the amount required to bias the tube to cut off with plate voltage applied but with no excitation to the stage.[1] In this instance the theory needs a little modification.

Old timers will doubtless recall the horrible noises that came from early Class B modulators of the 30's. This poor quality was due, for the most part, to modulator tubes being biased right to cut off. Perhaps as a result of those days the following rule of thumb was born. It is, in effect, "Bias the Class B stage until the static plate dissipation equals one third of the total available plate dissipation." Thus, properly biased Class B stages draw plate current while idling instead of being completely cut off.

To illustrate, let us assume a triode final with 75 watts of plate dissipation. One thousand volts is available for plate voltage. The question is, "How much bias?" A tube manual, tube data sheet or a handbook will usually give this information. Since these aren't available in this illustration, the following steps will supply the needed bias.

One third of 75 being 25, that is the number of watts the tube should dissipate while idling. Since 1,000 volts is available for the plate, the static plate current will be 25 milliamperes. Thus the proper bias will be that amount required to cause the tube to draw 25 mils with plate voltage on but without excitation. It is simpler to determine this than it appears. Bias of around 100 volts should be applied the grid. Then plate voltage is applied and plate current observed. Chances are that the plate current will be lower than the wanted



L1 - COUPLING LINK
L2 - TURNS REQUIRED TO RESONATE WITH C1 AT TRANSMITTER FREQUENCY.
C1 - 50 μμfd
C2 - .002 μfd
M - SEE TEXT
Y - 1N34 OR EQUIVALENT.

Fig. 1. Circuit diagram of a simple field strength meter, a most important piece of test equipment for adjusting linear amplifiers.

25 mils. The plate voltage is then turned off, the bias reduced and the plate voltage is re-applied. This is continued until the static plate current reaches 25 mils.

The same procedure should be followed if two or more tubes are used in the Linear Amplifier. It makes no difference whether the tubes are in pushpull or parallel. The only alteration that need be made in the above example is to multiply the one tube plate dissipation by the number of tubes used, to get the total available plate dissipation. From there on in, everything else remains the same. Pentodes and tetrodes likewise are governed by this same rule of thumb. Everything that pertains to the above

Norman was first licensed as 6BPT in 1921. In 1932, after recovering from the advent of the vacuum tube, he received his present call, W6GEG. An old time CW man, he has swung to 75 meter phone with the coming of SSB. Member Fresno Amateur Radio Club and R9 Club. Former Director San Joaquin Valley Amateur Radio Club.

example applies to these multi-grid tubes.

However, the static plate current can be reached by (1) altering grid bias with screen voltage fixed, and (2) altering screen voltage with grid bias fixed. Other things being equal it makes little difference which method is used assuming, of course, that voltages are reasonably near manufacturers recommendations.

Since both grid and screen voltages should be regulated in such amplifiers it is usually more convenient to alter the grid bias. In most pentodes VR tubes will provide adequate screen voltage regulation. Thus, if the screen voltage should be 450 volts, three VR-150's are usually put to work. This leaves the grid bias to be varied. Since little grid current flows, regulating the grid bias is usually quite simple. A well bled power supply capable of delivering several times the current required usually suffices. Varying such a voltage presents no real problems.

The actual adjustment of the Class B Linear bias is much simpler done than explained. While perhaps more intricate and exacting methods might exist, this simple rule of thumb will provide good sounding efficient operating Linear Amplifiers.

Usually another question that invariably comes up is "How much swamping?" Unfortunately no such simple rule of thumb exists for swamping because of numerous variables that exist between the exciter and final amplifier. Generally speaking a good rule to follow is to swamp all the power you can spare. Since certain tubes and certain modes of tube operation require no swamping the above can not be applied in every instance. The principle object of swamping is to provide a constant or near constant load for a preceding stage to work into.[2] Most zero bias tubes provide a sufficiently constant load that swamping is not required. Likewise, tubes which draw no grid current (because of their mode of operation) can get along very well without swamping.

Since the Class B Linear stage normally is driven into grid current, it naturally follows that swamping is advisable, unless the tube used is a zero bias tube. The exact amount can be readily determined by formula. However, a simpler method exists. This determination amounts to approximately, "The amount of swamping you can use is determined by how much swamping you can afford." If but 10 watts were available from an exciter it would be foolish to dissipate 9 watts in swamping resistors. This would be particularly true if 5 watts drive were required on the grid of the following stage!

In the above case a more realistic approach would be to swamp 5 watts. Swamping one half the total available drive is more than adequate for amateur operation. Since this is not always possible, swamping out any surplus drive will usually suffice. Here again common sense must be used. Many commercial SSB exciters are capable of 20 watts peak power output. They are often used to drive stages requiring but a fraction of a watt drive. Obviously the whole surplus should not be swamped out. On the other hand in view of the high availability-to-need power ratio, swamping is obviously highly desirable. Swamping is accomplished by use of *non inductive* carbon resistors. These are usually shunted across the grid tank coil of the driven stage. This appears to be the handiest point to swamp, although comparable results can be obtained by inserting swamping resistors across (1) plate tank of driver stage, or (2) across coaxial link that couples exciter or driver to final or stage to be swamped. (*Fig. 2A-B-C*) In addition to its principle function there is another advantage to swamping. It stabilizes wild amplifiers that are inclined to take off on their own. Swamping also discourages parasitics.

Another question that often comes up is "What causes limiting or flattening?" The words limiting and flattening are synonymous and have found great usage in SSB circles. This condition is brought about when a stage refuses to pass additional power regardless of increased drive. The tube becomes a limiter and its output viewed on a 'scope actually flattens on the peaks. The most general causes for this condition are (1) insufficient coupling of the output circuit, or (2) excessive drive, or (3) a combination of both. Most limiting in amateur equipment takes place in the final amplifier. The most common cause for this limiting is insufficient or improper antenna coupling. Running a close second to that is trying to put power into a poor antenna that simply can't take power.

A handy tool not only for checking limiting and correcting it, but for countless other uses, is the field intensity meter. The schematic of the meter used by the author will be found in *Fig. 1* or in any handbook. It consists simply of a germanium diode, a war surplus 0-30 volt d-c meter, a coil, a condenser and a box to mount the parts in. All parts came from the junk box yet the device is one of the most valuable pieces of gear at the station. Since only comparative readings are needed, it need not be calibrated. Thus any meter with a movement that is within the current capabilities of a germanium diode will do. The more sensitive the movement the closer comparisons that can be made. One-mil meters and micro-ammeters will do very well in this regard. A small pickup coil or wire oriented in the field of the trans-

mitting antenna should be connected to the field intensity meter by means of coax, twin lead or even twisted pair (lamp cord). The amount of pickup required will be determined by the sensitivity of the meter used.

Obviously, to be of value the meter must read RF from the antenna. Reading RF from any other source is worthless for this purpose. If any doubt exists as to where the RF might be coming from, make the following check: Insert carrier (or test tone) to normal peak input to final amplifier. Connect meter to coupling device and adjust coupling so that with full power input you get full scale meter deflection. Once this adjustment is made the meter coupling should be well anchored in that position.

Now reduce transmitter antenna coupling. If the meter is reading RF from the antenna its reading will go down. If it goes up the chances are it is picking up stray RF from the final. This should be corrected by re-orienting the RF pick up to the meter, shielding the meter, or both.

Having determined that you are reading RF from the right source, increase antenna coupling. When the final amplifier is drawing the predetermined amount of plate current for maximum input, note the grid current and field intensity meter readings. Write them down, along with the plate current reading.

With the drive remaining the same, retune antenna coupling and plate tank tuning for maximum deflection on the field intensity meter, ignoring for the moment all other meter readings. If the antenna has been improperly coupled an increase should result in the field intensity meter reading and plate current with a decline in grid current. In such instance, reduce drive to the point where the plate current is again normal and retune grid and plate tanks. Continue the above until maximum field intensity reading is achieved at the predetermined plate current. Upon reaching this condition, note the grid current, balance out the carrier and adjust the speech level to where voice *peaks* swing the plate current up to the predetermined level. Grid current peaks should swing up correspondingly to just about the value noticed before the carrier was balanced out.

Now it could happen that the antenna was fully coupled and further tuning made no change in the field intensity meter deflection. In this case, increase the drive to the final and watch for a corresponding increase in field intensity meter deflection. If it does not develop, output remains the same over a wide variation of drive, you have either (1) an inefficient antenna coupling system, or (2) an antenna that simply won't take any more power. To overcome these you have some rebuilding to do in one of the two, or possibly both, departments.

Meanwhile, until the rebuilding is undertaken, the limiting can be eliminated by reducing power to just a shade below the point where output (as indicated on the field intensity meter) fails to rise as increased drive is applied. Regardless of how little input this might be, it is the point at which your final should be run and remain linear. The same rules apply to intermediate driver stages when it comes to loading, except as Ehrlich points out, it is referred to as "impedance matching"[3]. Thus coupling between the exciter and final, exciter and driver, driver and final might bear close scrutiny.

Limiting can occur in exciters and drivers. It is easier to spot here since grid meters provide a means of checking linearity. If the grid meter fails to rise with corresponding increase in excitation, limiting is taking place.

Most causes of insufficient drive lie in insufficient or improper coupling between stages. When a driver will put out 20 watts of power yet can not drive a final requiring 5 watts of power to full input it should be obvious that impedances are not being matched.

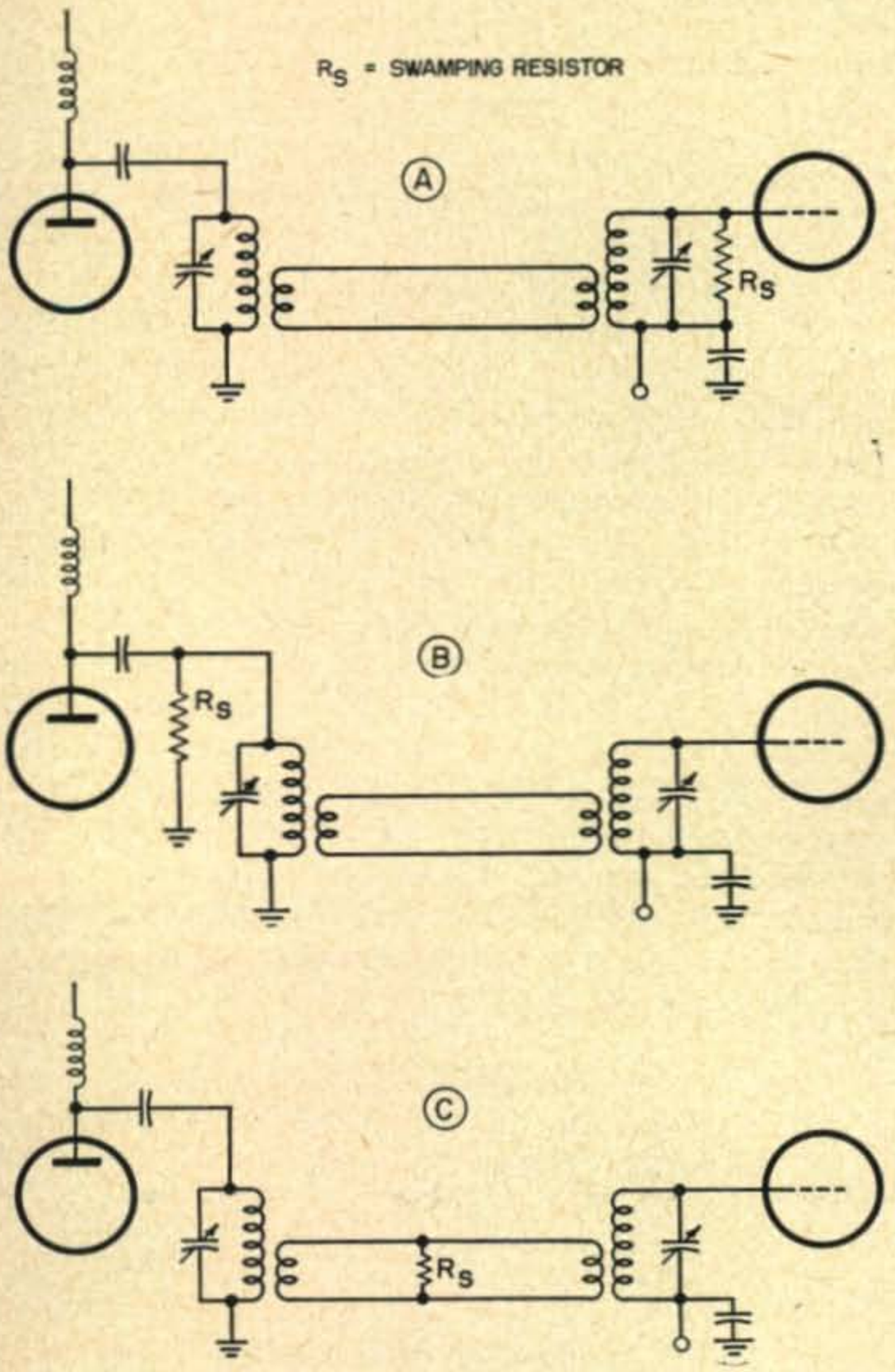


Fig. 2A-B-C. The swamping resistor (a non-inductive resistor) **serves to reduce the power input to the amplifier and also stabilizes touchy amplifiers. Here are three points in the transmitter where it can be used.**

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[1]ARRL Handbook, p. 59 (1953 Edition)
[2]"Sugar Coated Linear Amplifier Theory," *QST* Oct. 1951
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Radio's Rugged Ranks

by Carl Perko, W2GMU/1

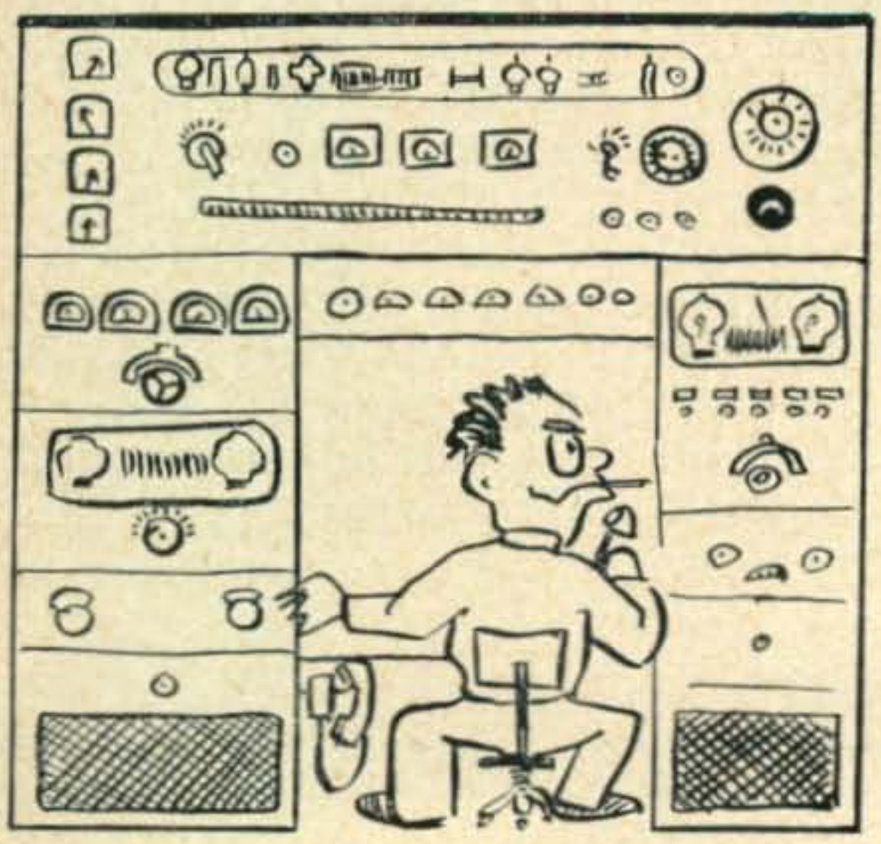
30 Petrova Ave., Saranac Lake, N.Y.

The Old Timer and I hadn't seen each other for a long time, so when I dropped by to see him the other day, it was a pleasure. It is always nice to know that people can be good friends without falling all over each other. Our infrequent visits are always enhanced by wassail of some kind or other; this time it was Old Gassmeyer, "The Beer That Made Milwaukee Jealous." Naturally we got around to the old hobby in a hurry and kicked it about a bit. I mentioned that I had heard a particularly silly transmission on 75 phone recently. It was one of those rig descriptions which accounts for each and every element in the system from the line fuse to the far antenna insulator.

The OT poured me more Old Gassmeyer and said, "It doesn't take all kinds, but we've got them anyway. I've worked out of half a dozen call areas under as many calls and I guess I've known just about every kind of Ham there ever was. At any rate, I've met up with some pretty typical ones.

"Jack the Spider was an example for you. Talk about wire——that guy had plenty of rigs but they all looked the same. Just a bunch of parts laying around with yards of loose wire hanging it all together. It looked like the picture in a health book showing the circulatory system——only with more colors. Some leads were soldered but a good many of them were just twisted together. And the Spider sat in the middle of it all. Back in the days when a Yagi on the roof meant a Ham in the house, the Spider went up to check his antenna one night and happened to get a foot caught in his handiwork. Jack reached for something, evidently to regain his balance. He must've grabbed wire. The Spider always did admire Cadillacs. It's too bad he drew the kind with the door in the back end.

"Mack, the Master Mechanic, on the other hand, really went in for permanent construction. This old friend of mine would start off



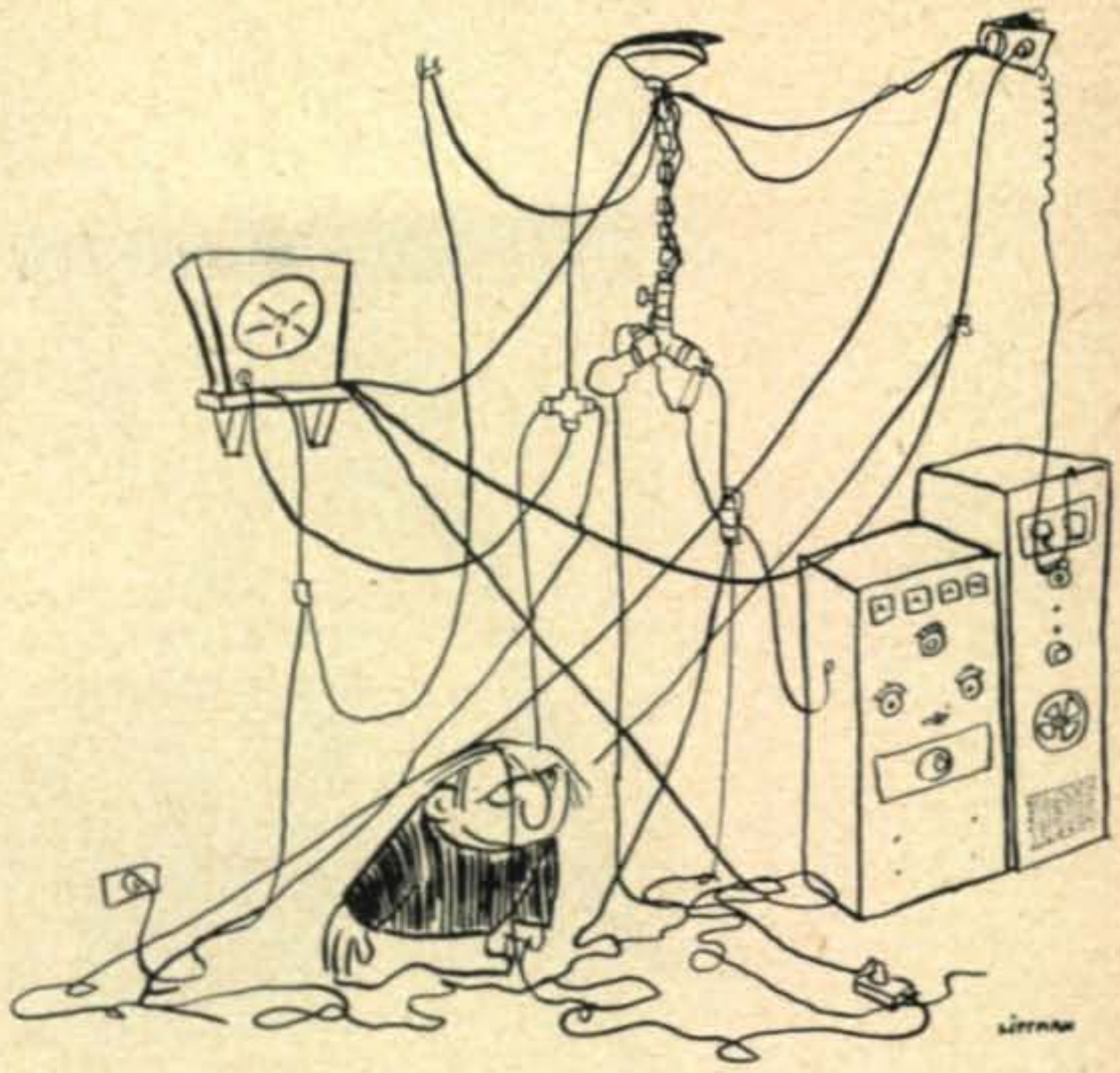
". . . he can remember the call of the only station in Azerbaijan . . . but he never remembers his wife's birthday."

with a lot of metal stock, his machine shop, and a year's ration of spare time. He'd begin in machining, threading, reaming, burnishing, plating, and spraying. None of us ever had to worry much about the task of making a hole in a panel for a meter or transformer with Mack around. The Master Mechanic's idea of a nice afternoon project was running foot-size hole in a piece of quarter-inch boiler plate and then threading a plug to fit same. He even made his own knobs for controls and such——he was the first one around here to have a hydramatic beam rotator. Mack didn't seem to go in for much DX or rag-chewing or traffic——you can't very well run a bug with one hand and a Blanchard with the other."

I agreed with my friend that such a man as Mack would find little time for anything like traffic work. "How about a real traffic man," I inquired, "you must have known some of them in those days."

"Well, I guess so, now. Postal Pete was our boy. The A-1 bona fide traffic op. Postal would get up from the supper table and dash off to his shack. His rig was an 801 deal built into an old Victrola case——which he dusted and tuned once or twice a year. I can't remember too much about the other equipment he had ——receiver and such——but the layout was something! Postal had himself an old Oliver typewriter, a green eyeshade, black sleeve covers, and even a little fence-and-gate arrangement across the room. There were paper spindles, clip boards, message blanks, tote baskets, a safe, a date-time stamp, and a pigeonhole desk. He had no QSL's on the wall, but there was a Seth-Thomas clock fully two feet in diameter. I don't recall whether Postal Pete had a bicycle and messenger cap, and there's no good in letting exaggeration creep in, yet he *might* have had them at that. Well, anyway, you had to admire his sense of responsibility."

Postal Pete, the A-1 Traffic Op.



Jack the Spider, who lived in a maze of wires.

We strolled into the kitchen of the house to see how the supply of Old G. looked. "So, looks like you've given up on the new double-superhet deal and bought the XYL a new washer," I exclaimed.

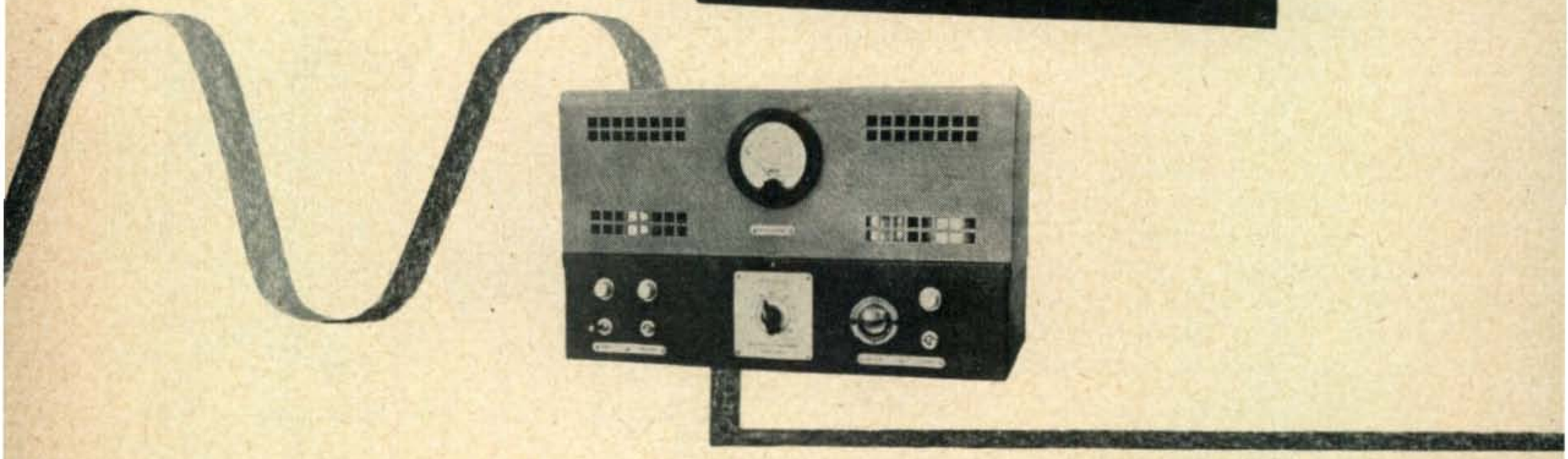
"Yup, traded the old one in, and it was about time, too. Sort of reminds me of Trader Schraeder, one of the gang down at the old Key Klix Klan——*there* was a real radio club, son. Trader's place would make the IRE Show look like some exhibit at the junior high on Endeavor Day. By the time I got the rumors on new stuff, Trader had one. He must have had a standing order with the Lenient Lebanese & Company for everything new that came along. You'd ask Trader how he liked his new ZZ-104A, and he wouldn't remember too much ——having already traded it in on a new Super Band-Banger II. He had his junk box, all right, but what a wonderful one——maybe one item or so would have showed any signs of having been soldered onto. The rest was strictly off your favorite dealer's shelf. Whenever Trader Schraeder started out to put up a new antenna, for example, he would go out and buy a whole reel of wire or transmission line. Often he would change his mind and never use the stuff. Nice for the kids just beginning, though. They could always talk him out of a hank of EO-1 cable, a meter, some tubes, or a lot of things. I could never savvy how the Trader did all this on his income, but it was his——not mine—— so it was none of my business."

I offered my venerable friend the suggestion that the Trader must have taken good care of his equipment so that he could make favorable trade-in's.

"He sure did. He was not like that character, Diddler O'Day. For a guy who started out like a person with a brain all in one heap, Diddler

[*Continued on page 54*]

really regulated



Frank H. Tooker, W2VQL
Box T, Lakehurst, N.J.

At one time or another, most of us have had our troubles with the wandering output voltage of a conventional rectifier-filter type power supply. True, there are lots of applications around the shack where even a 30 or 40 percent change in supply voltage with changes of line voltage and load current is no great drawback. But there are quite a few other uses where a change in B-plus voltage is about as welcome as a pink QSL from the FCC, or one of those Presidential "greeting" cards. It need hardly be emphasized that a VFO without regulated B-plus is an invitation to chirp and frequency shift. But there are also lots of other applications where a really stiff supply is worth its weight in Fort Knox potatoes.

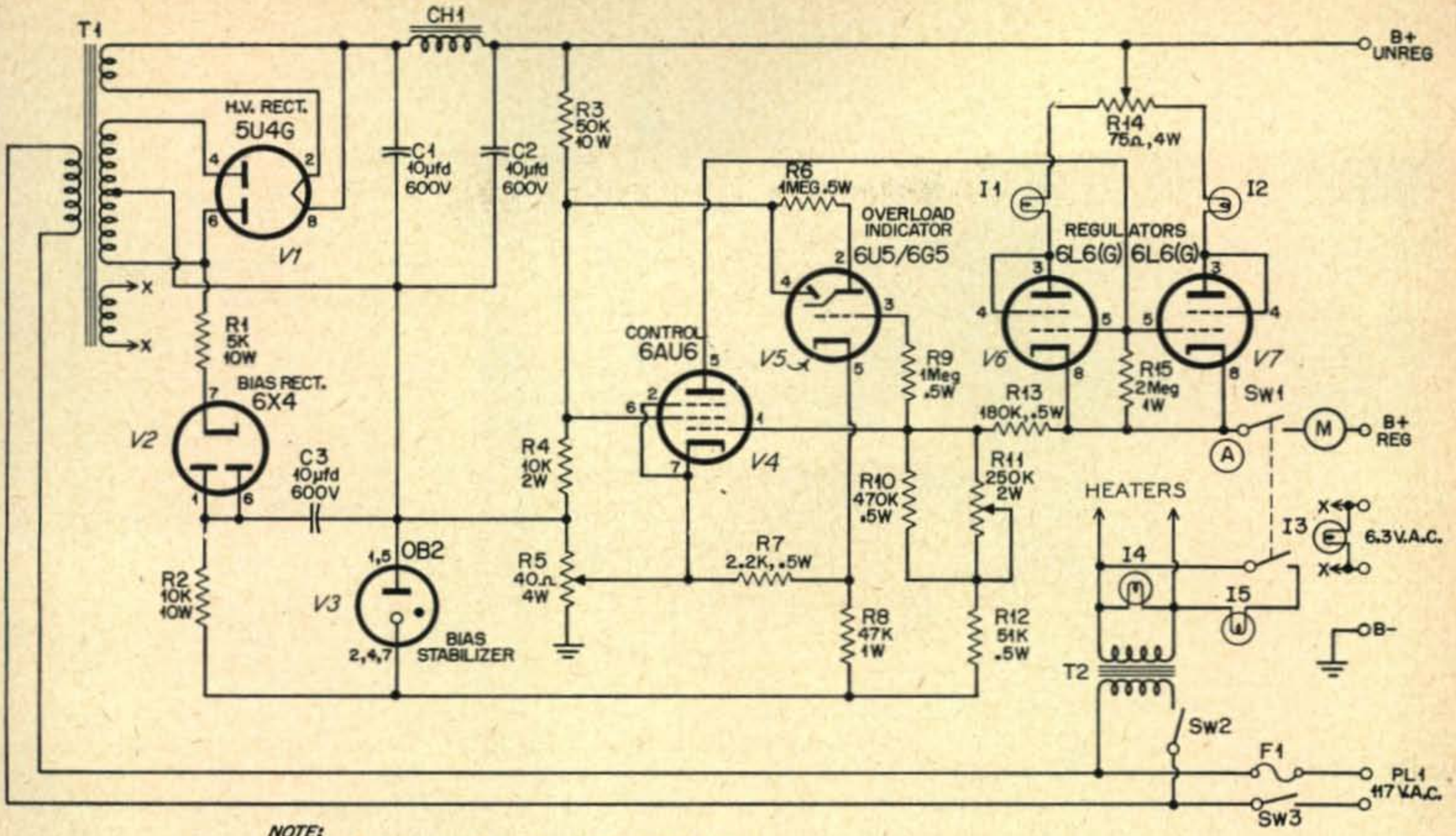
For one thing, when firing up and testing a new piece of gear on the bench, a regulated supply lets you know what the thing is really doing, without the necessity of making allowances for the rubbery supply voltage of the average utility bench power unit. And the highest "hi-fi" amplifier ever built will behave better and have less tendency to take off by itself at low frequencies if the power supply has approximately zero internal impedance, or thereabouts, as seen looking back from the load.

Another characteristic of a good regulated supply that's downright indispensable once you get used to using it is the variable output voltage. It's a great convenience to be able to jockey the supply voltage to a stage or unit up or down as you please when testing or tuning up, especially when you can rest assured it will stay "put" within the limits of its current capacity, and give you warning when that capacity is exceeded. A crying need for this kind of power supply came to a head at W2VQL recently, resulting in the development of the unit described here, with most gratifying results.

TABLE I

Output Voltage (A)	Control Grid Voltage (B)	Plate Voltage (C)	Input Voltage (D)	Output Current (MA)	Regulator Grid Bias (A) - (C)	Cathode Voltage (E)
90	-3.57	26.0	480	0	64.0	--
100	-3.58	36.8	480	0	63.2	--
110	-3.59	47.5	480	0	62.5	--
120	-3.60	58.5	480	0	61.5	--
150	-3.61	94	480	0	56	--
180	-3.62	130	480	0	50	--
240	-3.66	200	480	0	40	--
350	-3.82	330	480	0	20	--
90	-4.4	54	440	50	36	-1.25
90	-5.5	67.5	400	100	22.5	-2.4
90	-6.4	75	375	150	15	-3.6
90	-7.4	82	340	200	8.0	-4.8
150	-4.7	122	440	50	27.5	-1.4
150	-5.9	132	400	100	17.5	-2.7
150	-7.2	141	365	150	8.6	-4.2
150	-8.3	147	340	200	2.7	-5.3
240	-4.3	219	440	25	20.5	-0.85
240	-5.0	226	420	50	14.0	-1.65
240	-5.8	232	400	75	8.3	-2.45
240	-6.5	235	380	100	4.6	-3.5

Table 1. Measurements are made with a VTVM having at least 10 megohms input impedance.



NOTE:
1. CIRCLED LETTERS REFER TO COLUMNS IN TABLE 1.

C1, C2, C3—10 µfd., 600v.
R1 — 5000 ohms, 10w. wirewound.
R2 — 10,000 ohms, 10w. wirewound.
R3 — 50,000 ohms, 10w. wirewound.
R4 — 10,000 ohms, 2w.
R5 — 40 ohms, 4w. potentiometer.
R6—1 megohm, ½w; part of magic eye assembly.
R7—2200 ohms, ½w.
R8—47,000 ohms, 1w.
R9—1 megohm, ½w.
R10—470,000 ohms, ½w.
R11—250,000 ohms, 2w. potentiometer.
R12—51,000 ohms, ½w.
R13—180,000 ohms, ½w.
R14—75 ohms, 4w. potentiometer.
R15—2 megohms, 1w.
I1, I2, I3, I4, I5—Pilot lamp, brown bead, #47: 6-8v. @ 0.15 ma.
Sw1—d.p.s.t. toggle.
Sw2, Sw3—s.p.s.t. toggle.
T1 — Power transformer, 400-0-400v. @ 200 ma., 5v. @ 3 amps., 6.3v. at desired amperage. Stancor PM8412 or equiv.
T2—Filament transformer, 6.3v. @ 3 amps. Stancor P-6466 or equiv.
M—0-200 ma. milliammeter.
Ch1 — Smoothing choke, 8h. @ 200 ma; Stancor C-1721 or equiv.
F1—Fuse, type 8AG, 3 amps.
Pl1—Recessed connector, Jones 61-F10 or equiv.

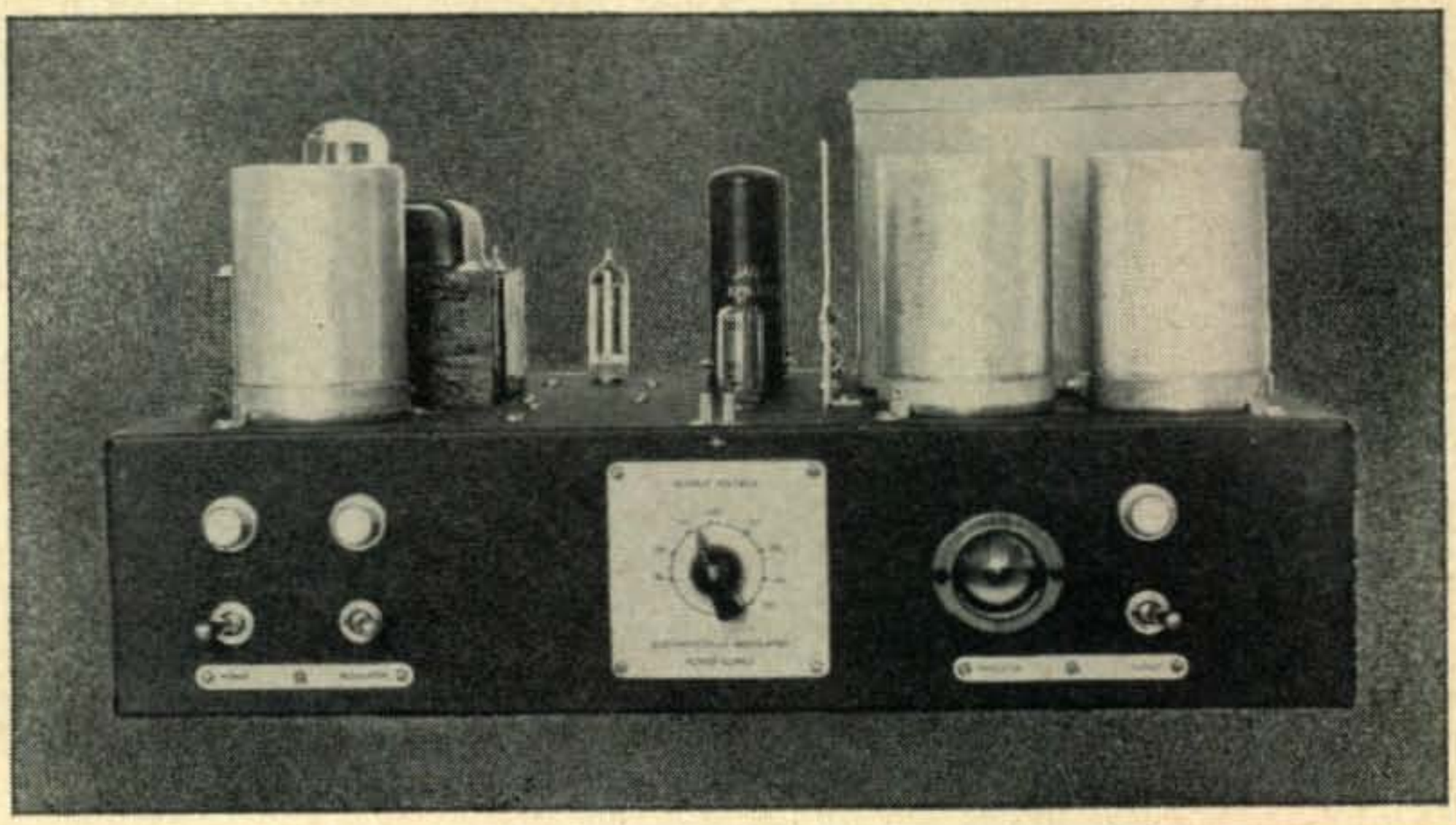
Fig. 1. Wiring diagram and parts list of the "Really Regulated" power supply. Designed to supply a regulated voltage with less than 0.2 volts maximum variation at full load at any voltage from 90 to 350 volts. Maximum current capacity is 200 ma.

The v-f-o keying now sounds nearer to WWV instead of a musical saw, and the workbench no longer gets littered with freshly pulled hair when something is being tested.

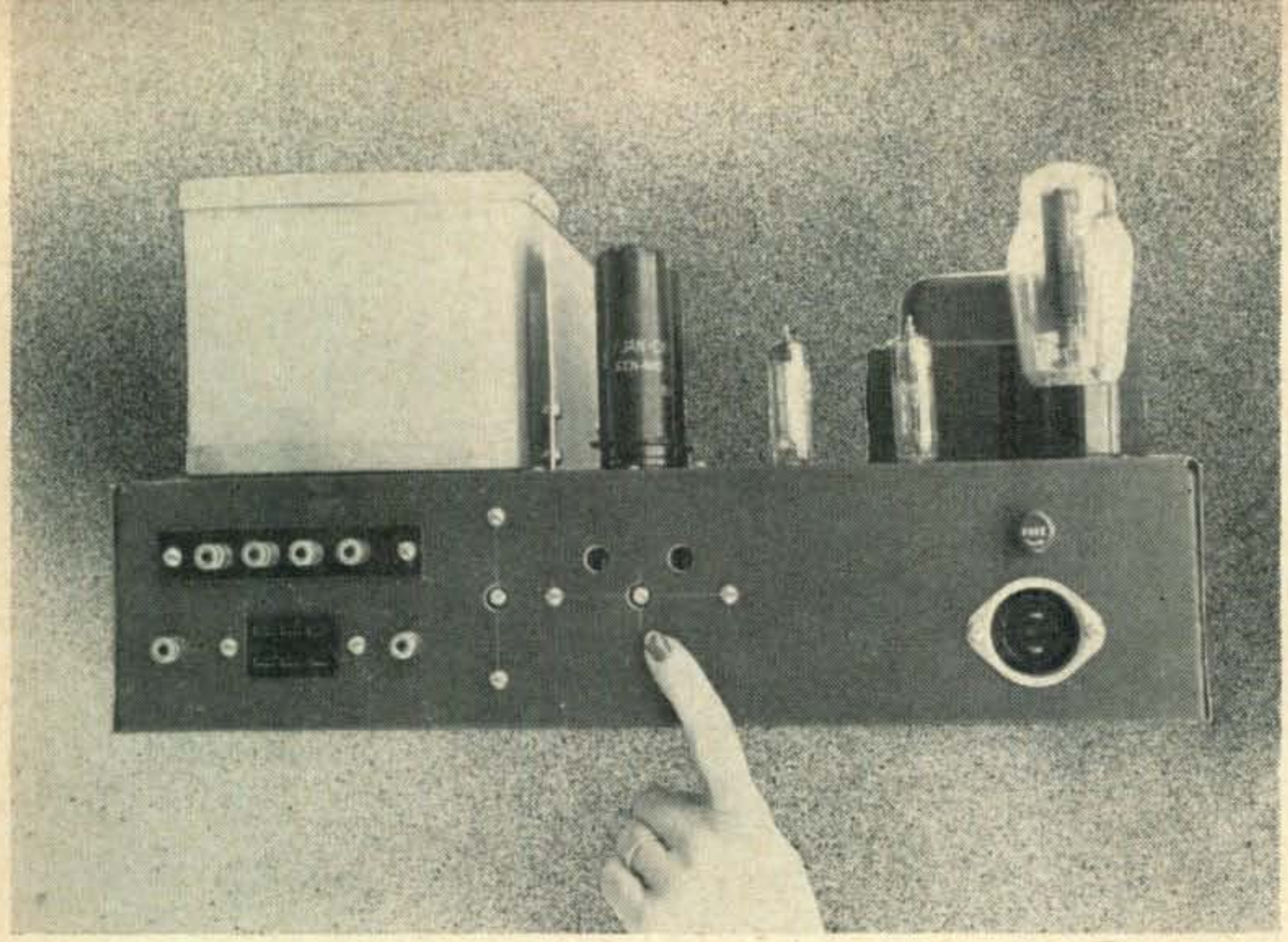
After some headscratching, it was decided that a supply providing regulated voltage anywhere in the range from about 90 to 350 volts, and capable of delivering about 30 watts of power to the load circuit, would cover most contemplated uses. In addition, it was desirable that the output voltage be really stabilized over the range, not just within a few volts, but within fractions of a volt. How well the present unit fills these needs can be seen by a look at *Table 1*, and the curves of *Fig. 2*.

General Design Considerations

Regulated power supplies of the electronic variety require three principal parts: (1) a



Front view of the power supply showing the loss-of-regulation "eye" indicator.



Rear of the regulated supply, R5 being pointed out.

control stage to sense the output voltage error and provide a control signal; (2) a regulation stage, the impedance of which can be varied by the control signal; and (3) an unvarying reference voltage against which to compare the output voltage. The first need can be filled by a good, high-gain, sharp-cutoff pentode. The second requirement is easily met with a beam tetrode or tetrodes in parallel, as required by maximum current drain considerations. If the amplification factor of this stage is high, so much the better. The third need is best met with a battery of some sort, but can also be handled by a gas voltage-regulator tube, or even by a resistorless neon bulb in a pinch.

The voltage applied to a regulator from the rectifier-filter circuit must of course always be considerably higher than the required output voltage. The difference between this raw supply voltage and the regulated output voltage appears as the voltage drop across the regulation tubes, which varies as the plate-to-cathode impedance of the regulation stage is varied by the control signal. To make control possible, the circuit must be so designed that any change in the regulated output voltage, slow or rapid, will cause a change in the grid-to-cathode voltage of the control tube. The resulting change in the control tube plate current in turn is used to alter the grid-to-cathode voltage of the regulation stage, in such a direction that the plate-to-cathode impedance of the regulation stage changes in the proper direction to counteract the change in output voltage. In an electronic supply, this sequence of actions is so rapid that it can be considered instantaneous for all ordinary usage. It easily follows the ripple frequency of a poorly filtered supply, and tends to wipe out the effects, so that the regulator serves as a very effective filter in addition to its regular function.

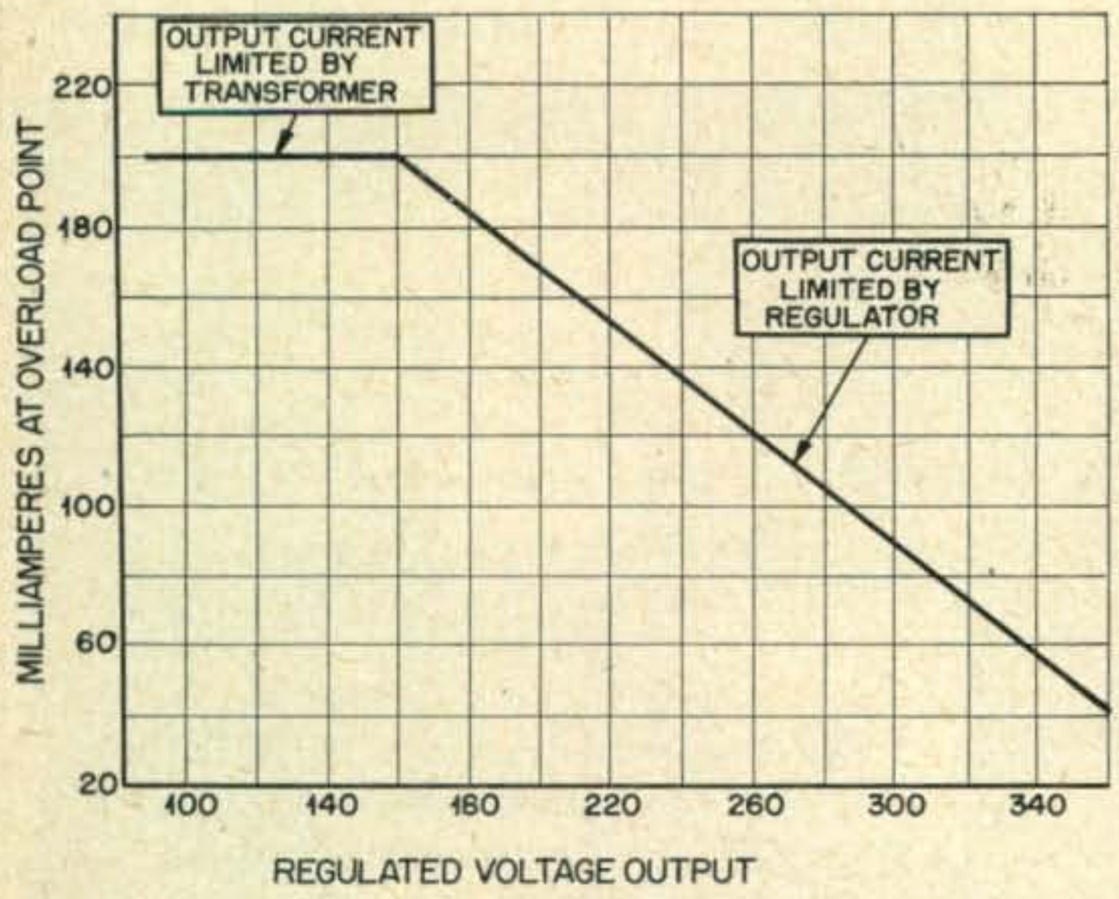


Fig. 2. Performance of the supply, showing the current capacity available at any specific voltage.

In designing a supply from scratch, it is necessary to know the range of voltages wanted, and the maximum current drain that will be required at the maximum voltage. When these values are known, the type and number of regulation tubes can be determined, from a study of the characteristics of available tubes. In general, Class A plate dissipation and plate current ratings apply. In this connection, note that, if the range of output voltage is to be large, as in the unit described here, it is necessary to use tubes of higher internal impedance than the more common 6B4 or 6AS7G. Use of the 6AS7G in this circuit would have limited the lowest regulated potential to about 165 volts, instead of about 75 volts, which is the point where the present unit begins to lose control.

Special Features

Certain special features were wanted in the supply of a sort not usually included in standard electronic regulator circuits. For one thing, a higher degree of regulation accuracy than that provided by conventional regulators was required. Examination of the tabulated performance will show that, at 150 volts output, the voltage changes only 500 microvolts per milliampere of load current, up to a drain of 100

ma. Even to 200 ma., the figure remains under one millivolt per mil. An overall tell-tale was also a requisite, so that loss of regulation would be immediately apparent. This is provided by the 6U5/6G5 tube, which blinks when control is lost. A means of balancing the current in the regulation tubes is also provided, which is useful if the supply is to be run near its maximum ratings. Without it, one tube may be caused to overheat by carrying more than its share of the load on heavy drains.

Licensed as W2VQL in 1947. Operated mostly on 10 meter phone and 20 meter CW. Principle interest is in receiving and test equipment rather than operating. Started with a crystal set when seven years old, spent twelve years in commercial electronics as lab technician and engineer, and at present is in the printing business with the electronics taking the hobby role. He prefers it that way.

Circuit Theory

Details of the circuit action can be followed in the schematic of *Fig. 1*. The filtered output from the 5U4G rectifier (*V1*) is applied to the plates of the regulation tubes, *V6* and *V7*, with the transformer center tap returned to ground through *R5*. A negative voltage is thus developed across *R5* which is proportional to the current drain. This enters into the control action, as explained below. The 6X4 bias rectifier (*V2*) provides the negative voltage across *V3*, the OB2 voltage regulator for the reference voltage.

The reference voltage provided by *V3* and the regulated output voltage, which appears at *V6* and *V7* cathodes, are connected through limiting resistances to opposite ends of potentiometer *R11*, in the control grid circuit of *V4*, the control amplifier. A voltage of –2 or –3, depending upon the setting of *R11* and the current drain from the supply, appears between grid and cathode of *V4*. Since the cathode voltage of *V4* is held substantially constant by *V3*, changes in the grid-to-cathode voltage are only produced by changes in regulated output voltage.

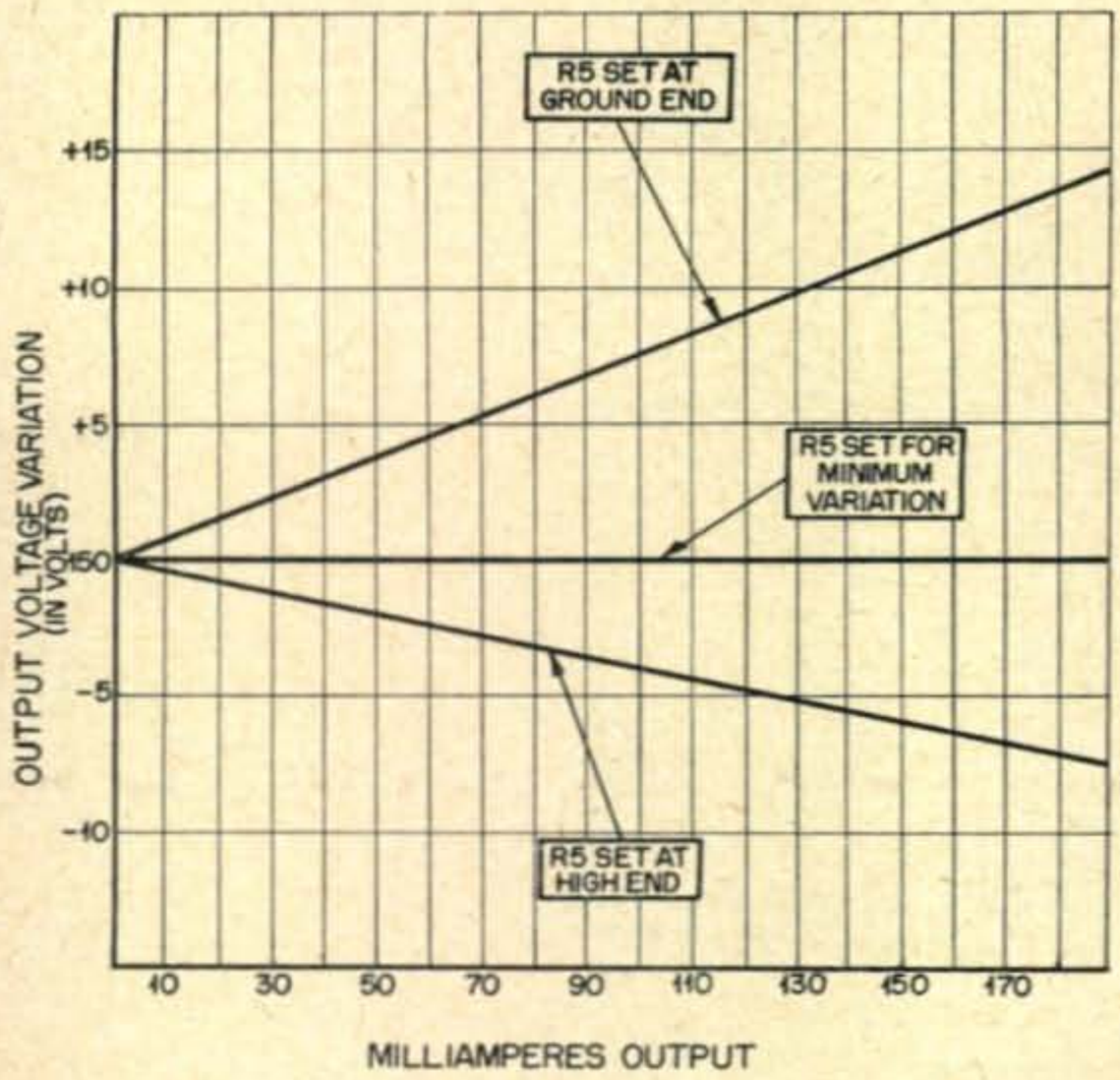


Fig. 3. The adjustment of R5 is important to the regulation, as can be seen from this graph. When R5 is properly set the variation in output voltage is difficult to detect, even over a wide current range.

Plate current for *V4* is supplied through *R15*, which is also in the grid circuit of *V6* and *V7*, the regulation tubes. Thus a change of *V4* plate current alters the voltage drop across *R15*, changing the bias on *V6* and *V7*, which alters their effective plate-to-cathode impedance. The polarity of the change is such that, when the output voltage tends to increase, *V4* plate current increases, grid voltage on *V6* and *V7* becomes more negative, *V6* and *V7* internal impedance increases, and the output voltage between *A* and ground is returned to almost exactly the former value.

When the output voltage tends to decrease, the effect is exactly opposite, again holding the output voltage at the preset value. Due to the direct coupling, the control circuit follows the slowest changes (in fact it's a d-c amplifier), yet it can also respond to changes that take place extremely rapidly. *(Note: Bypassing* R13 *with a suitable capacitor will further improve the ripple-swamping action and response to rapid changes of output voltage—Ed.)* Perhaps the simplest way to think of the circuit is to consider *V6* and *V7* as two variable resistors in series with the supply voltage, that can be varied by *changes* in the output voltage in such a way as to correct for all but a very small part of the change.

The overload monitor (*V5*) is so connected that the same change in output voltage that appears at the grid of *V4* is impressed on its grid. The cathode is held at the correct voltage through its connection to the junction of *R7* and *R8*. As long as the output voltage is held substantially constant by action of the regulation tubes, the grid-to-cathode voltage of *V5* can change very little, and the eye will stay open. However, when *V4* loses control of the output voltage, the grid-to-cathode voltage of *V5* changes sharply in the direction which closes the eye, indicating loss of regulation. A monitoring voltmeter across the output would serve the same purpose, but is not as sensitive unless operated in a bucking circuit, a highly inconvenient arrangement in a supply designed to provide a variable output voltage. It is not advisable to substitute a 6E5 for the 6U5, as it draws a greater cathode current, which is undesirable in this application.

(Continued on page 51)

21-Mc Converter

O. W. H. Johnson, W8LHK/2
105 Champlain Avenue, Staten Island 6, N.Y.

A hot crystal controlled converter to bring that elusive 15 meter DX in on your old receiver's 80 meter band.

Fig. 1. Top view of the 21-Mc Converter showing the parts placement.

If you, like the writer, have been struggling to make the most of those tempting 21-mc openings with an inadequate receiver, the crystal controlled converter may be the most painless cure for your troubles. After attempting to split hairs with the restricted bandspread afforded by the general coverage coil of the 1940 model HRO at W8LHK, it became apparent that either the operator's hand would have to be steadied, or the tuning would have to be slowed down. The converter described here is the result. It's relatively straightforward and painless to build and get going, and in conjunction with a receiver of even moderately good performance in the region of the 80-meter band, provides excellent reception during those increasingly frequent 21-Mc openings.

In the planning stage it was decided to convert the 450 kc of the 21-Mc band to fit in the generous bandspread of the HRO 80-meter amateur band coil. A noise figure that would permit antenna noise to be the limiting factor in reception was also considered a must, and since W8LHK is not blessed with the technical facilities of Bell Labs, a reasonably simple broadband circuit was a requisite. All these requirements were met in the final design, which provides crystal stability, broadband coverage of the full 21-Mc. band with adequate rejection outside the band, a noise figure well below antenna noise without resorting to cascode circuitry, and a broadband output without pick-up at the first i-f.

Circuit Theory

The input is designed for 50-ohm coaxial line, with link coupling (*L1*) to the slug-tuned

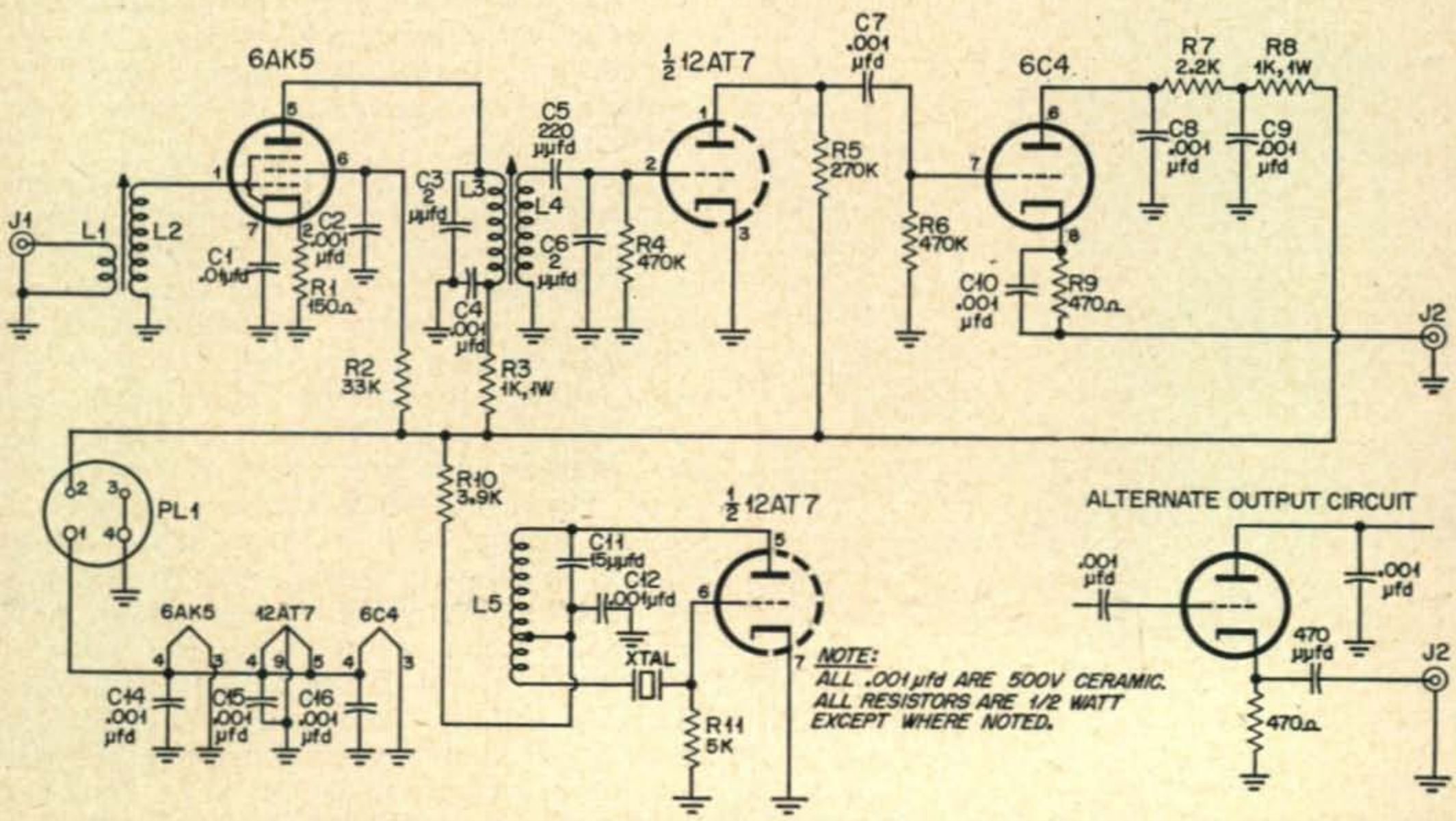


Fig. 2. Two outputs are shown, one for use where you have a d-c return through the antenna coil of the station receiver, and one for use where you are feeding a receiver input with no d-c return. Use the "Alternate Output Circuit" in the latter case.

grid coil (*L2*) of the 6AK5 r-f stage, as shown in *Fig. 2*. The use of the copper shield plate *(Fig. 3)* across the tube socket of the r-f stage insures freedom from self-oscillation tendencies under all normal conditions. However, it is inadvisable to substitute other types of bypass capacitors for the disc ceramics specified, as any added lead inductance may result in a tendency to regeneration, which will reduce the passband of the stage considerably. The plate tank circuit of the r-f stage employs a 2 $\mu\mu$fd tubular ceramic across the coil (*L3*) to provide an adequate minimum capacity. Tuning is accomplished by adjusting the coil slug.

Coupling to the 12AT7 mixer grid coil (*L4*) is controlled by adjusting the physical spacing between *L3* and *L4*, which is also slug-tuned. The second half of the 12AT7 serves as the oscillator, in a conventional Hartley plate-tuned circuit. Residual coupling between the two halves of the tube within the envelope is sufficient to provide adequate oscillator voltage in the mixer grid circuit. The oscillator plate coil (*L5*) is another slug-tuned coil, the feedback being adjusted by adding or removing turns from the appropriate end of the coil during tune-up. The mixer is resistance-capacity coupled to the 6C4 cathode follower output stage, providing broadband response at the 3500-3950 kc. if that would be difficult to attain with a simple LC circuit. Gain preceding this stage is such that there is no degradation of the noise figure because of the RC coupling used. The RC filter net in the B-plus lead to the 6C4 prevents i-f signal pickup on the B-plus lead from entering the receiver. The cathode output circuit shown in the main schematic of *Fig. 2* is suitable for use with receiver inputs which provide a d-c return path for the 6C4 cathode current. For other receivers, or where it is desired not to have d.c. wandering about through other units, the alternate output circuit may be used.

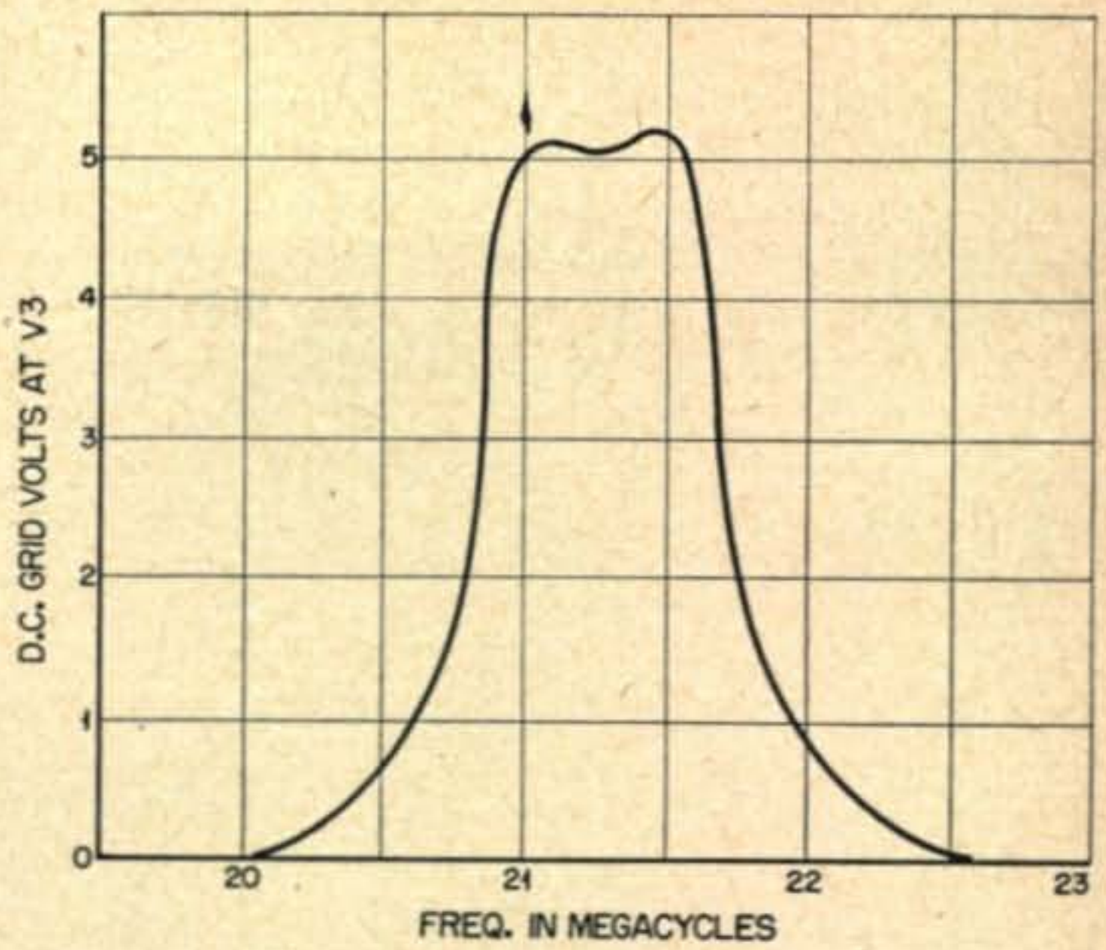


Fig. 4. Overall response curve of the converter when it is correctly adjusted.

Construction

The entire converter is built on a 3x4x1/16 inch brass or copper plate, which fits on a standard 3x4 inch utility box. The general layout of parts is readily seen in the top and bottom photographs of *Figs. 1* and *3*. The copper shield strip used to separate the r-f stage input and output circuits may be made of flashing copper or similar thin stock. It crosses the 6AK5 socket from *pin 3*, between *pins 1* and *7*, and extends across the chassis to effectively separate the input connector and the 6AK5 grid coil from the oscillator and mixer circuits. The shield is soldered to *pin 3*, the center grounding post of the tube socket, and to one of the 4-40 machine screws holding the Amphenol coax fitting. Note the short leads and dress of the 0.001 ceramic bypasses supported by their leads at the 6AK5 socket. This type of construction does much to prevent unwanted regeneration in an unneutralized high-gain r-f amplifier. The plate coil (*L3*) for the 6AK5 is mounted solidly, near enough to the socket to permit very short leads. Coupling to *L4* in the 12AT7 mixer grid circuit is varied by moving *L4* toward or away from *L3* in the slot cut in the chassis for the purpose. The lead

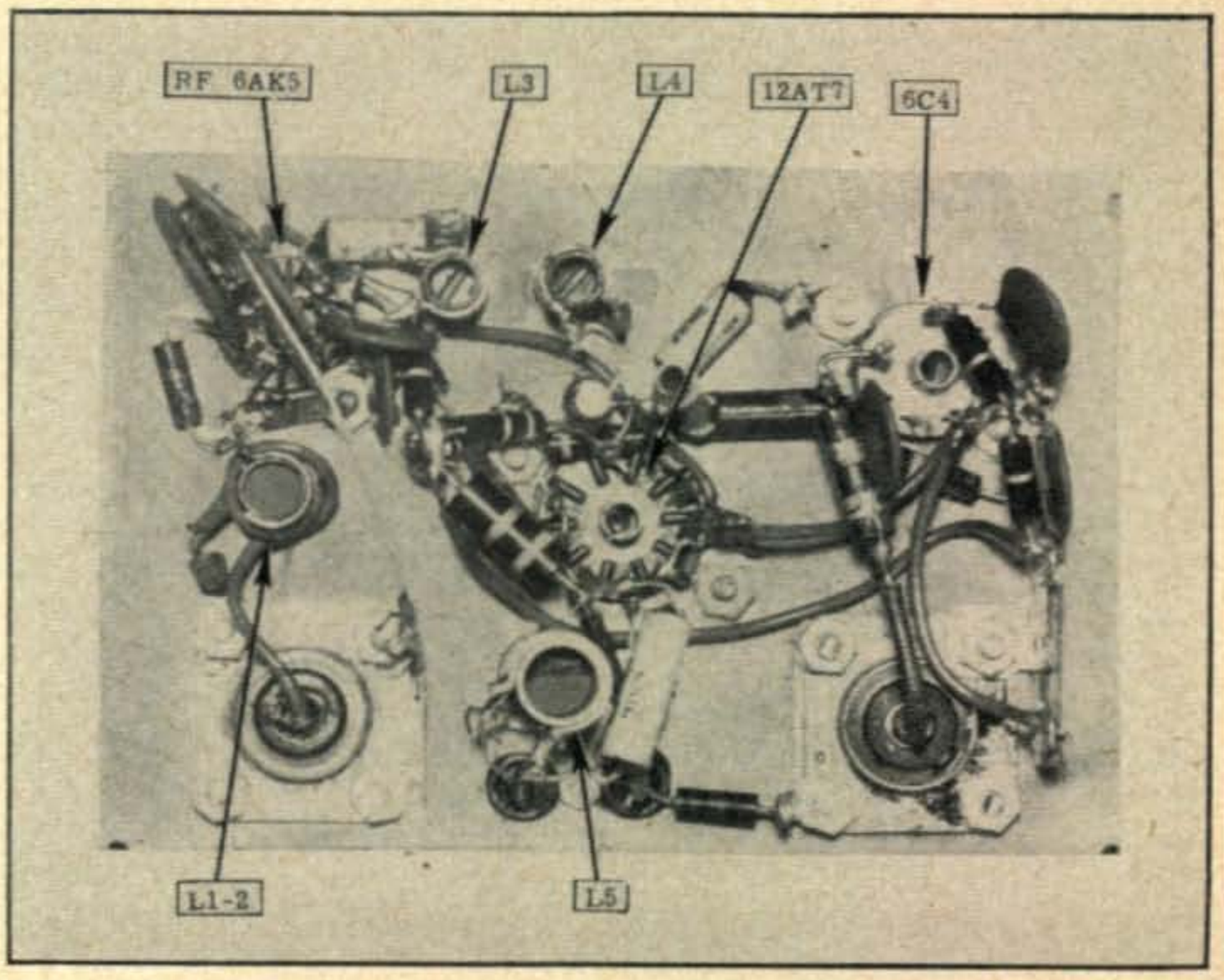


Fig. 3. Note short leads on parts. This results from careful placement of the mounted components.

from the hot end of *L4* to the grid is made of flexible plastic covered indoor antenna wire, to allow a reasonable range of coupling adjustment. The ground end makes contact with the chassis through a soldering lug placed under the mounting stud, which moves with the coil.

The remainder of the construction is straightforward, parts being placed for short, direct circuitry. Almost all wiring except the heater and B-plus is done with the resistor and ca-

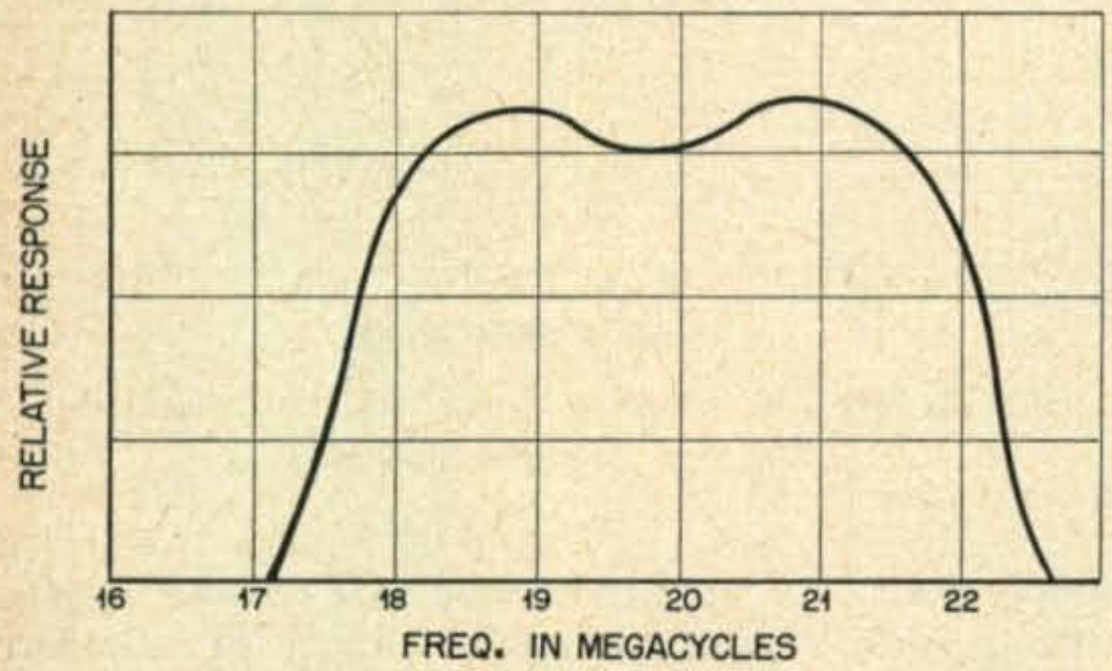


Fig. 5. Overcoupling can do this to the response.

pacitor leads. A 3-terminal tie point serves as junction and support for hot heater, B-plus, and ground connections. It is mounted on one of the machine screws holding the output coax fitting. Flexible leads from this terminal strip to the 4-pin male plug at the output end of the utility box complete the power wiring. This plug fits the cable termination of a utility power supply at W8LHK. Power drain is 6.3 volts a.c. at 0.75 amps for the heaters, and about 20 ma. at 100 to 150 volts for B-plus.

Tune-up and Adjustment

The only circuit adjustment likely to be at all critical is the initial adjustment of the overtone crystal oscillator circuit. The circuit as designed employs the third overtone of a 5830-kc. crystal, giving oscillator injection at about 17.5 Mc. It would also be possible to use a

Coil Winding Data

L1-3 t. wound around cold end of *L2*
L2-22 t. #30 enam. on CTC-LS3 form
L3-30 t. #30 enam. on CTC-LS3 form
L4-25 t. #30 enam. on CTC-LS3 form
L5-24 t. #28 enam. on CTC-LS3 form, tap 7 turns from the bottom

3.5-Mc. crystal oscillating at its fifth overtone, if this is more readily available. Placing the injection frequency above the 21-Mc. band as in conventional receivers is also feasible, but will cause the main receiver dial reading to tune backward; that is, 21 Mc. will come in near the high end of the 3.5 to 3.95 Mc. amateur band, with 21.45 Mc. near the low end.

Adjustment of the oscillator is easily done with the aid of a VTVM or high ohms-per-volt multimeter, and a receiver capable of tuning to the overtone frequency. With the heater voltage on but with B-plus on the oscillator only, and the crystal in the socket, tune *L5* through its range with the slug, while observing the voltage at the oscillator grid (*pin 7*) with the meter set on a 5 or 10-volt range. If a rectified bias voltage is found for all settings of *L5* slug, the oscillator is not under control of the crystal. This can be checked by listening to the oscillator signal in the receiver, while bringing a finger near the coil. If the signal frequency shifts drastically, it is not crystal controlled. Oscillation regardless of slug position indicates excessive feedback, which can be reduced by removing turns from the grid end of the coil, and retuning with the slug. This is more convenient than moving the coil tap. When the right amount of feedback has been found, the oscillator bias will start abruptly as *L5* is tuned through crystal resonance, and drop as suddenly on the other side. Adjust the feedback to give about 5 to 7 volts negative at the grid (*pin 2*) of the mixer. (A multimeter will read lower than a VTVM here.) If no oscillation is had at any setting of the *L5* slug, check the circuit wiring for correctness

First licensed in 1933, he has had the calls W1JCT, W2ZYX, KH6KU, KG6DK and at present W8LHK. Enjoys building and experimenting with VHF equipment. His favorite band is two meters. Active mobilewise on 10-15-20-40 and 75 with all home-built gear. Just in the process of moving to New York City from Ohio. Has been in Coast Guard for 23 years and now holds rank of Commissioned Warrant Officer.

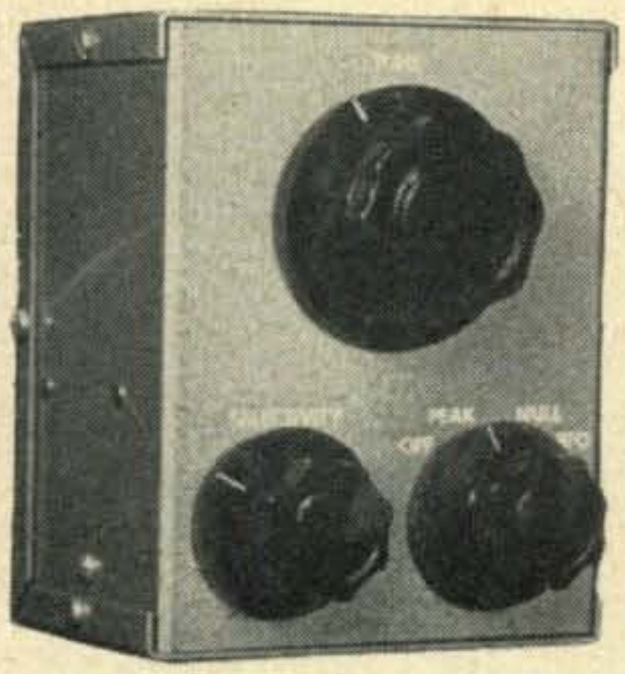
before increasing the feedback by removing a turn from the plate end of the coil. When crystal controlled oscillation is obtained, check with the receiver to see that oscillation is on the correct overtone of the crystal selected.

With the oscillator operating correctly, apply B-plus to the remaining tubes, and connect the converter output to the input of a receiver tuned to about the middle of the 80-meter band. Connect a 50- or 70-ohm carbon resistor (whichever is a proper matching value for your transmission line) across the converter input, and adjust the *L2* slug so that the input stage is tuned to about the middle of the 21-Mc. band. Remove the resistor and loose-couple a grid-dip meter or other signal source to the input through a length of coax, this time with the terminating resistor at the signal source end. Set the signal at about 21.225 Mc. and connect the VTVM probe to the cathode follower grid. With *L3* and *L4* separated as far as the slot will allow, tune both coils to resonance. Adjust the coupling be-

[*Continued on page 53*]

more on the

Q multiplier



W. M. Scherer, W2AEF
Contributing Editor

An article was presented, in January 1955 CQ, regarding the operation and construction of several Q Multiplier models. These electronic units provide high degrees of i-f selectivity, and they are of extreme usefulness for CW, AM, SSB or mobile reception. The response from readers has been nothing short of terrific, and mail comments and inquiries have simply snowed us under. It is hoped that the following text, in the form of questions and answers, will aid those who may be concerned. The components, referred to, are those shown in Fig. 1 of the original article.

Question: Is it possible to use the Q Multiplier at frequencies other than 455 to 500 kc?

Answer: Yes. *L1*, *L2*, *C3*, *C4* and sometimes *R4* will have to be changed.

Q: Will it be effective at other frequencies?

A: Yes, but for a given *Q*, the sharpness of the response characteristics may vary, because this is a result dependent on the ratio of the Q to the frequency. As the frequency is raised, the response characteristics can be expected to have a wider bandwidth.

Q: What are the values to use for a BC-348 receiver which employs an i.f. of 915 kc?

A: *L1*—Grayburne (Superex) V6 Vari-Choke with 300 turns removed, and for connecting cable use about 2 feet of RG59U; *L2*—Vari-Loopstick as originally specified; *C3*—25 $\mu\mu$fd; *C4*—400 $\mu\mu$fd; *C5* –0.001 μfd; 500 $\mu\mu$fd. and .0014 μfd. may be used for *C4* and *C5*, respectively, at a slight reduction in coil *Q*.

Q: What are the values for 262-kc. auto receivers?

A: *L1*—Grayburne (Superex) V6 Vari-Choke as is; *L2*—2 Vari-Loopsticks in series aiding (the inside of one winding connected to the outside of the other), mount with centers about one inch apart; *C4*—0.002 μfd; *C5*—4000 or 4500 $\mu\mu$fd; *R4*—see following answer.

Q: How may the values for other frequencies be determined?

A: *L1* in shunt with the capacitance of the connecting cable should resonate at the i.f. used. The capacitance of 2 feet of RG59U is about 42 $\mu\mu$fd. From this the value of *L1* may be calculated. *L2* in shunt with the total capacitance of *C4* and *C5* in series, together with one half of *C3* (its approximate value

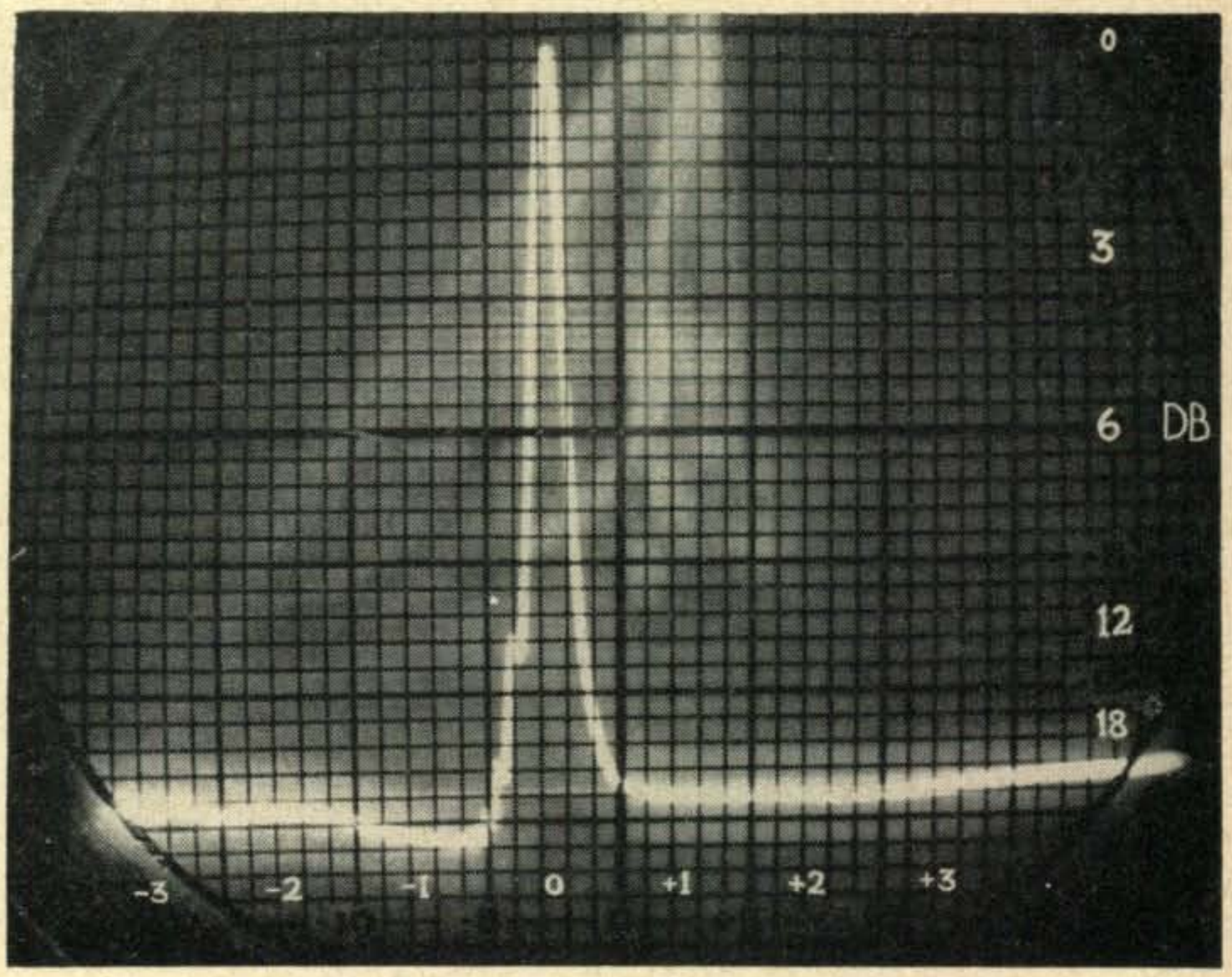


Fig. 1. Q Multiplier *peak* response characteristic, centered on 455 kc. Tendency toward "ringing" is indicated by jagged edges at lower left of trace. Note that vertical db. scale is not linear. Horizontal scale indicates kc. off resonance. Bandwidth at the 6 db. points is about 300 cycles.

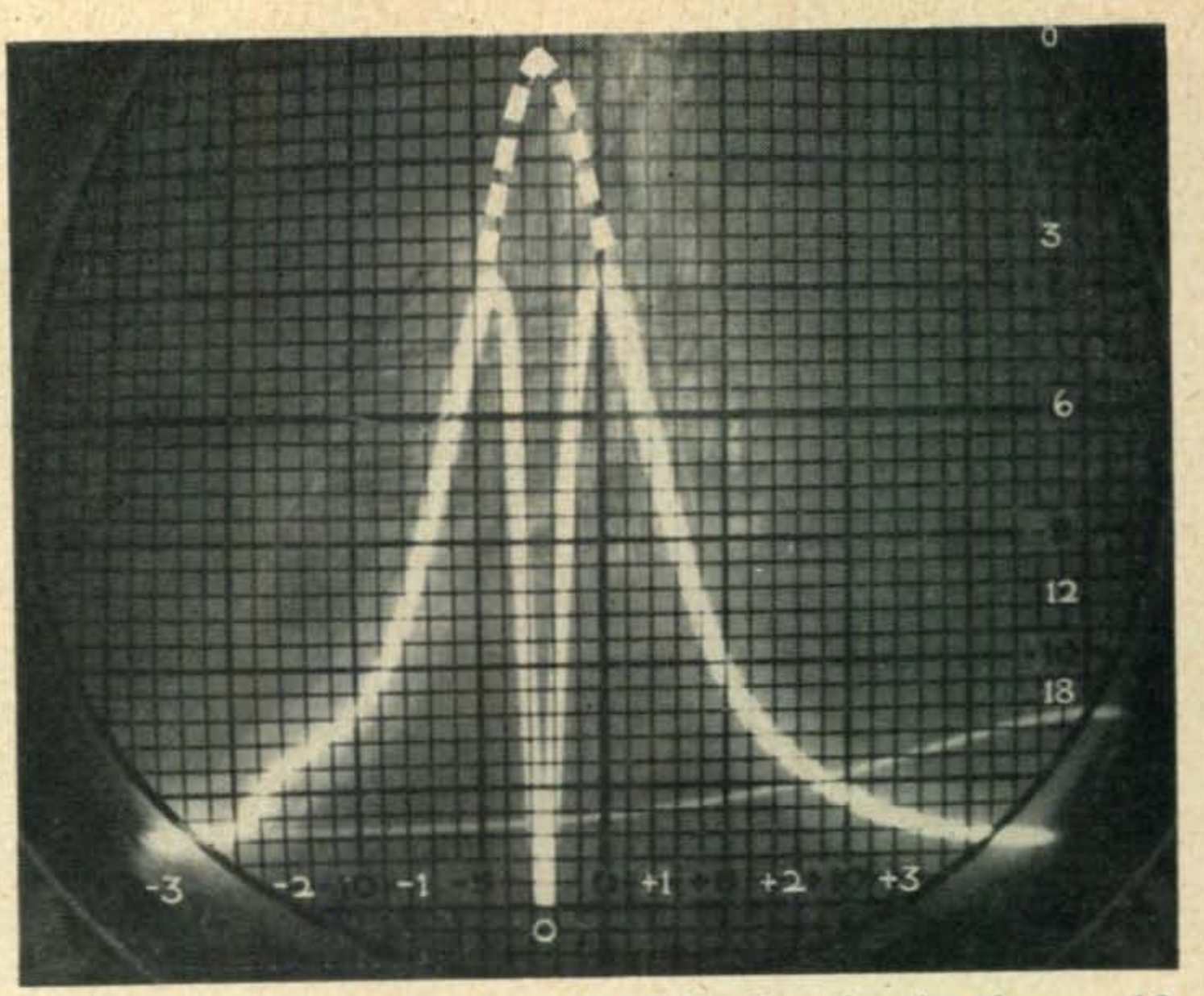


Fig. 2. Q Multiplier *Null* response with notch centered in passband. The dotted line indicates the response before the notch is inserted. Curve is plotted in kc. off resonance horizontally and db vertically. Bandwidth at the 6-db points (original peak) is about 550 cycles, and is about 300 cycles with the resulting maximum response.

at the center point) in parallel, should resonate at the i.f. The total capacitance is equal to $\frac{C4 \times C5}{C4 + C5} + \frac{C3}{2}$. *C5* should be larger than *C4* by a factor of from 2 to 3. *R4* may have to be altered to permit a point of oscillation to occur within the range of *R7*. This point should be that where about one quarter of the resistance of *R7* is used. The total *C* should be as high as possible in order to realize high *Q* and stability, provided, it does not require the value of *R4* to be reduced below a few thousand ohms. More data on the ratio of *C4* and *C5* will be found in the answer to a later question.

Q: The values of *R4* and *R5* are the reverse of those shown in October 1953 *CQ*. Are those currently shown correct?

A: Yes.

Q: Other *Q Multiplier* circuits use a different input circuit arrangement with a tapped or split coil for *L1*, and an additional B plus line to the bottom of *L1*. Why is *Fig. 1* different?

A: The above arrangement often results in instability or spurious oscillations. Although this can be corrected, adjustment is often touchy and critical. When the *Null* position is used, any instability here can alter the response of the normal passband of the i-f amplifier outside of the change created by the notch.

Q: Can other type tubes be used?

A: Yes. Most of the high mu triodes will work satisfactorily. A 12AT7 may be substituted. If only the *Peak* function is desired, a low mu tube, such as a 6C4 or one half of a 12AU7, may be used. *R4* will have to be reduced to a size which will permit a point of actual oscillation to be obtained within the range of *R7*.

Q: May wire-wound potentiometers be used?

A: Yes.

Q: Some other *Q Multiplier* circuits show a 10 m.h. choke instead of the 2.5 m.h. size as indicated in Figure 1. Is 10 m.h. OK to use?

A: Yes. A 10 m.h. choke will provide slightly better isolation between the B plus. 2.5 m.h. is specified, because this size is more generally available, and performance with this value is satisfactory.

Q: The Vari-Loopstick, specified for *L2*, has a coil of loose wire wound around the outside of the form. Is this to be used in any way?

A: No. This excess wire, which is connected to one of the terminals, should be cut off and not used.

Q: When the *Q Multiplier* is connected to the receiver by means of the coax cable as specified, the signals disappear (in some cases there may still be signal, but with a high drop in level). Tuning of *L1* does not restore the signal level. What is wrong?

A: Let us first assume the wiring has been made correctly. If *L1* is the specified V6 Vari-Choke, no trouble should be encountered in this respect over the 455- to 500-kc i-f range, but in extreme cases, the capacitance of the cable may be too high or too low. A change in the cable length should correct the trouble. If an i-f transformer is used for *L1*, it may be necessary to use only one of the transformer windings instead of the two connected in series as originally specified. The need for one or both windings will depend on the capacitive padding which originally was used across one winding, and on the capacitance of the connecting cable. If the original transformer padding was low (50$\mu\mu$fd), one winding is all which may have to be used, but if it was higher (100 $\mu\mu$fd or more), both windings may be required. The inductance of *L1*, together with the capacitance of the cable, should be such that

[*Continued on page 50*]

the YL's Frequency

Monitored by

Louisa B. Sando, W5RZJ

Jicarilla Apache School, Dulce, New Mexico

Long-Time YLs

Did you ever stop to think what it would have been like to be the very *first YL* to enter an all-male hobby? We have no actual record of who that privileged girl may have been, but from comments of old-timers and what records there are, it appears that the first lady amateur to be really well known from the Rockies to the East Coast was 8NH, Emma Candler. Emma began operating as 8NH in January, *1915*, was very active in relay work, and held a 2nd grade commercial license. Emma was featured in "Who's Who in Amateur Wireless" in *QST* for October, 1916. And in the May, 1917 issue there was a photo and description of 8NH, Emma's station at St. Mary's, Ohio. At this time 8NH had been copied in thirty states; had worked 9ZF in Denver, and ships off Key West, Fla. and Cape Race, Newfound. The photo shows a big spark set, probably a full kw. The antenna is described as 87 feet long, 58 feet high, six wires, center lead-in. The item stated that 8NH was equipped to receive long undamped waves.

Out on the West Coast, Winifred Dow, 7FG, of Tacoma, Wash. was well known before World War I. She was written up in the April, *1917* issue of *QST* and a picture appears there also. A charming looking girl, her age was given as 14 years. She claimed to be the first and only licensed girl operator in the Pacific Northwest. Winnie was active in the Radio Club of Tacoma, and her post-war call was 7CB. In 1922 she became radio editor for the *Tacoma Daily Ledger* and was program director for their BC station—the first in Tacoma. Winnie tells us she dropped out of radio after she became Mrs. Williams, has raised two boys and a girl and is now a grandma. For the past twenty years she and her OM have been in the newspaper business in Alaska.

In the August, 1917 issue of *QST* there appeared an Editorial entitled, "The Ladies Are Coming." It predicted that there would be several hundred women operators in the U.S. when amateur wireless opened up again after the War. It cautioned care in the use of "OM" on the air and ventured "DG" (meaning "dear girl") as a possibility. We never have heard that one, and the prediction as to the number of YLs seems to have been slow in materializing.

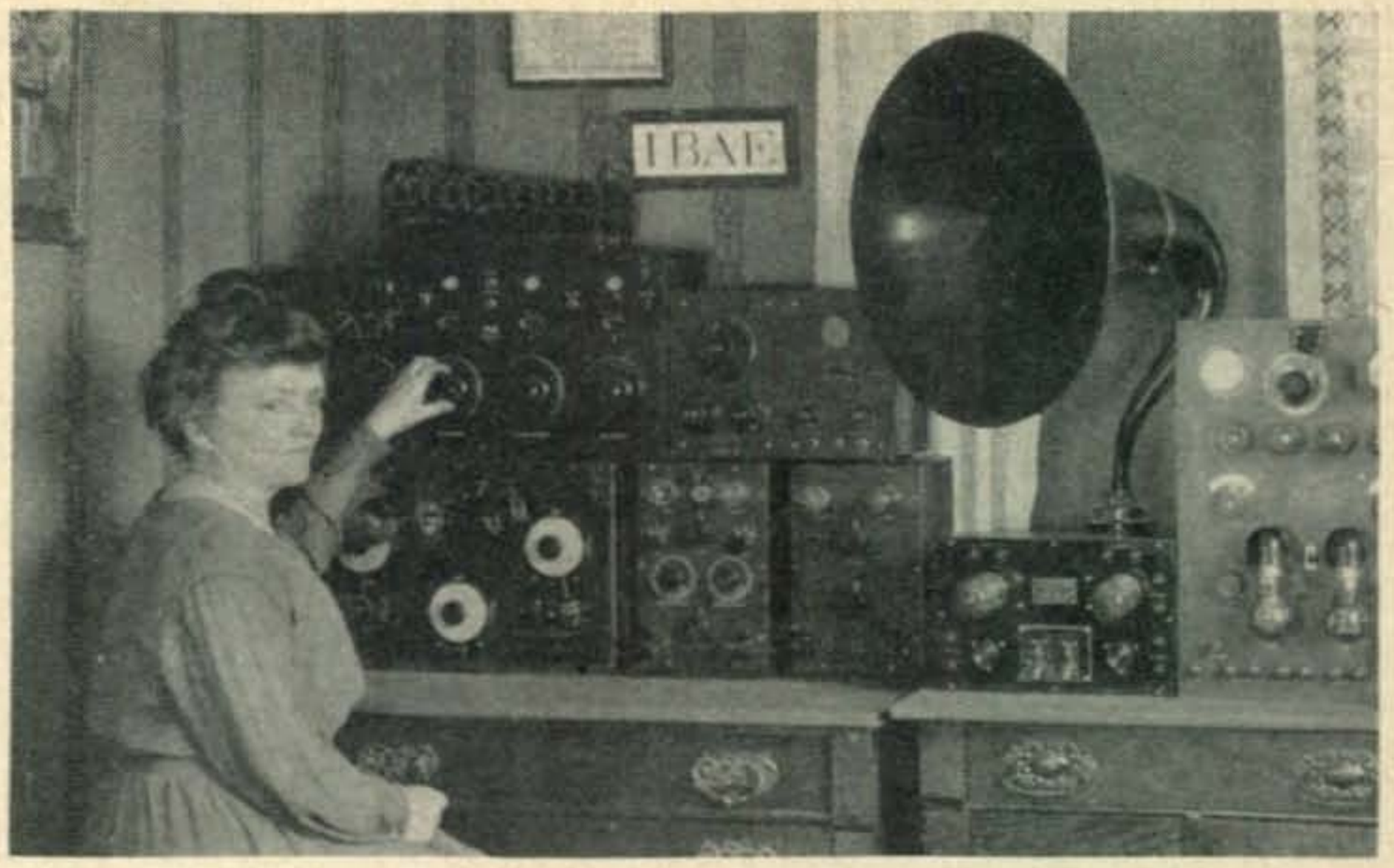
(Below) W1MPP, Eunice Randall Thompson, surrounded by examples of some of the hobbies she enjoys besides Ham radio. Eunice first went on the air via experimental station 1XE in 1917, had her own station, 1CDP, in 1921.

Commercial Licenses

Apparently there were a number of girls who were sufficiently interested in radio to acquire commercial licenses, but not all of them took it up as a hobby. The January, *1917* issue of *QST* mentions a girl in Mexico, Maria Dolores Estrada, who was a 1st grade commercial operator and had been working for Carranza as his private telegrapher. In 1916 she came to the U.S. to learn English and later took a course with the National Radio School in D.C.

The September, *1919 QST* contained an item stating that Lorena M. Reed of Richmond, Me. was anxious to

Edith Rotch is active in MARS as A1ZR. Her first call was 1RO received in 1919. U.S. Army photo.



The late May Smith, W1BDN, operating her station, 1BAE, in 1923. She first went on the air in 1920 as 1DBE.

enter the relay game. Lorena held a 1st grade commercial ticket and had worked with several radio manufacturing companies. She also held a Lieutenant's commission in the Radio Corps (part of the Signal Corps) where she worked on vacuum tubes.

Early YLs Still Active

So far as we can learn, the earliest licensed YL still active on the air is Edith Rotch of Boston, Mass. Edith received a commercial 1st grade license in 1917, and her amateur license in *1919* with the call 1RO. Edith says she belonged to the "Greater Boston Spark Coil Club," had a rig on 200 meters, and an "umbrella" antenna on the roof. She became 1ZR in 1926. In the first World War Edith was a junior inspector in the Signal Corps during the days, and in the evenings was code instructor and examining officer at the U.R. Radio School in Boston. She once worked as a telegraph operator and holds 35 WPM CPC. W1ZR works both CW and phone—CW during the winter months in Boston because of TVI, and phone from her summer beach-side cottage at Nonquitt, Mass. She uses a Viking I as well as a small CW rig. Edith is active in MARS as A1ZR and checks into a number of the nets. This very capable YL also has been active in numerous other hobbies: dancing, skating, tennis, sailing, bowling and bridge.

W2QCC, Pauline Ann Raser, of Trenton, N.J. says she was introduced to the wonders of wireless by her future OM in 1918. He was in Naval Service as a radio operator. Polly learned the code unbeknown to him and one day tried to send code via the hand-squeeze system—holding hands!—a big surprise to him. It brought it's reward—by *1920* Polly was operating her OM's spark coil rig using his call, 3CS and later 3ZI (now W2ZI). Polly received her first call, 3AEC, in 1923; then W3HVO in 1930, which was changed to W2QCC when South Jersey became part of the 2nd district. She has been 3rd D/C of YLRL. Most of her more recent operating has been on 20, 40 and 80, usually CW. She says one of the early YLs she remembers QSOing is W2WP, Alice Picard, of Staten Island, N.Y. Polly is not active on the air now but is active in club work. She has served two terms as president of the Ladies Auxiliary of the Delaware Valley Radio Assn. and is now vice president.

Early YLs Featured in CQ

Many of the other early YLs have already been featured in this column, so just a few highlights about these girls now to complete this account.

The late May Smith of Manchester, N.H. first went on the air in *1920* with the call 1DBE. Her call was changed to 1BAE in 1923 and later to W1BDN. (See "YL's Frequency," *CQ*, Macrh, 1947) As far back as *1880* May was a part-time operator on a telegraph line in northern New York, having learned the code while in her teens. While in her 80's W1BDN was still active on 10, 20 and 75 phone and 80 CW.

The next recorded item about a YL is that of M. Adaire Garmhausen, whose humorous article on "How to Build a Wireless Station" appeared in *QST* for July, *1920*. W3CDQ, Liz, tells us she met Adaire in 1923 and gives her call as 3BCK, her QTH as Baltimore, Md.

Among the long-time YLs still active on the air, W1MPP, Eunice Randall Thompson, dates her start in radio as 1917 when she worked for experimental station 1XE at Medford Hillside, Mass.; her first Ham ticket as

Pauline Ann Raser, now W2QCC, operating her OM's station, 3CS, in 1922. Right: Polly as she is now recently photographed at QTH of CO5JK at Cardenas, Cuba.

1921. (See "YL's Frequency," *CQ*, April, 1948) Her call then was 1CDP and she operated from her home near New Bedford. Her actual station was remotely controlled, a line extending from her brother's mill a quarter mile away. "The noise from the quenched spark gap—wow!" is her comment. But she adds, "200 meters was so wonderful." In 1929 Eunice went to work for the New England Power Company in Boston, and last Oct. 14 celebrated her 25th anniversary with NEP! In 1938 she went on the air as W1MPP from Watertown, Mass. Now W1MPP gets on the air every trip to her home at Lovell, Me. operating 2, 6, 10, 75 and 80.

Over the years Eunice has added many hobbies to that of Ham radio, several of which are obvious in the accompanying photo. An early art student, Eunice still likes to paint, especially on trays, does needle point and petite point, collects buttons and coins, makes jewelry and ceramic pieces. She also hooks rugs and one of hers was included last season in the famous exhibit at Worcester, Mass., for which rugs are brought from all over the U.S. Now she is studying weaving and has learned Braille so she can do transcribing to help where there is such a need.

Eunice's activities at 1XE were recounted in *QST* for July, 1921 and her amateur work in September of that year. Following this announcement of a first district YL

Though her call has remained the same, W3CDQ, Elizabeth Zandonini's present station is quite a change from her first one in 1923. And the lowest power she has ever used, says Liz.

1st International YLRL Convention

Date: June 24-27, 1955
Place: Miramar Hotel, Santa Monica, Calif.
Sponsors: Los Angeles YL Radio Club
Chairman: W6UHA, Maxine Willis
Housing Chairman: W6JZA, Elsa Wheeler

Members of the Los Angeles YL Club are opening their homes to YLs who will attend the convention (see details in "YL's Frequency" last month). If you wish to stay with a YL, or want help in securing hotel reservations, write to W6JZA at 6453 N. Livia Ave., Temple City, Calif. (Telephone: Atlantic 73494)

a letter appear in December, 1921 QST from 5ZT claiming that the Houston Radio Club had four YLs and that he could name ten more who were operating in the fifth district. To date we have been unable to track down any of these YLs.

Elizabeth Zandonini of Washington, D.C. first went on the air in *1922* with the call 3CDQ, which she has held ever since. (See "YL's Frequency," *CQ*, December, 1946) Liz says that she and Adaire, 3BCK, were the only YLs in that area for quite some time. Her interest started much earlier, however, and she obtained a commercial ticket in 1917 while still in high school. Later she taught radio in Army hospitals in Camp Meade and Fort McHenry for rehabilitation work, as a member of the Woman's Radio Corps. In 1921 Liz became a radio aide at the National Bureau of Standards and last July she celebrated her 33rd anniversary with the CRPL division before it was moved to Colorado. Since then she has been in the Radioactivity Section of NBS. Liz is a past president of YLRL. She spends all of her time on CW. Her present station is a Viking II with Viking VFO, HRO receiver and a Windom-type off-center-fed antenna cut for 40 meters.

The March, *1922* issue of *QST* contains an item stating that Helen Long of Champaign, Ill. had taken up radio, but no further details were given.

In April, *1922* there appeared an item regarding the second district convention in which it stated that Ruby Yelland won the ladies' code speed contest at 30.5 WPM with perfect copy.

More Early YLs

First licensed in *1923* was Loretta Ensor who went on the air with the call 9UA while still attending high school. (See "YL's Frequency," *CQ*, February, 1947) Loretta's purpose was to establish a radio station in the Olathe, Kansas, High School where her brother Marshall, 9BSP, was an instructor. Loretta's call was used by the school radio club until 1940 when the station was moved to the Ensor home.

Loretta and Marshall received well-deserved recognition when Marshall was awarded the Paley award for 1940. This was for the Ensors' code practice and courses in the fundamentals of radio which they transmitted from the fall of 1929 until Dec. 7, 1941. During winter months Marshall and Loretta transmitted nightly and through their work they helped thousands of amateurs to pass the license exams.

Now WØUA, Loretta still operates occasionally on skeds, and in RACES for local civilian defense. She uses her brother's kw rig or one of their numerous small ones. Loretta says that when she went on the air in 1923 she was the only YL in the whole midwest area and that the girls who came on later, in the 30's, listened to her

[*Continued on page 58*]

WØUA, Loretta Ensor, is more apt to drive this "CAT" or do other things on the family farm than get on the air. But Loretta has totalled many hours of operating since she first received her call 9UA in 1923.

ALL TIMES IN EST

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Northern & Central Europe	0900-1330 (1-2)	0600-0730 (1-2) 0730-1400 (3-4) 1400-1600 (2)	1600-2000 (3-4) 2000-0500 (2)	1730-2000 (2-3) 2000-0300 (3-4)
Southern Europe & North Africa	0830-1400 (2)	0600-0730 (2) 0730-1600 (3-4) 1600-1700 (2)	1700-2100 (3-4) 2100-0300 (2-3)	1800-2000 (2-3) 2000-0200 (3-4)
Near & Middle East	0830-1400 (1)	0630-1500 (2-3)	1800-2100 (2-3) 2100-2300 (1-2)	1930-2300 (1-2)
Central & South Africa	1000-1430 (1) * 0930-1130 (1-2) 1130-1530 (2-3)	0630-1300 (0-1) 1300-1830 (3)	1800-0030 (2-3)	1930-2330 (1-2)
South America	1100-1600 (1) * 0900-1500 (2-3) 1500-1800 (3-4)	0600-1500 (2-3) 1500-1900 (3-4) 1900-0300 (1-2)	1800-0500 (3-4) 0500-0700 (2-3)	1900-0500 (2-3)
South East Asia	NIL	0630-0900 (0-1) 1630-1830 (0-1)	0400-0700 (0-1)	NIL
Australasia	1600-1900 (1)	0630-0930 (2-3) 0930-2000 (0-1)	2300-0100 (2-3) 0100-0600 (1-2) 0600-0800 (2-3)	0000-0700 (2-3)
Guam & Pacific	1600-1800 (0-1)	0630-1000 (1) 1500-2100 (1)	2200-0730 (3)	2300-0700 (2-3)
Japan & Far East	NIL	0630-0830 (1) 1600-1800 (1)	0200-0700 (1)	0300-0600 (0-1)

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	0900-1300 (1)	0600-0800 (1-2) 0800-1300 (3) 1300-1500 (1-2)	1700-2000 (3) 2000-0400 (1)	1830-0200 (2-3)
Southern Europe & North Africa	0900-1330 (1-2)	0600-0730 (1-2) 0730-1500 (3-4) 1500-1600 (1)	1700-1900 (3) 1900-0100 (1-2)	1830-0100 (2-3)
Central & South Africa	1000-1400 (1) * 0900-1500 (2-3)	0600-1300 (1) 1300-1800 (2-3)	1800-0000 (2-3)	2000-2300 (1-2)
Central America & Northern S. America	1030-1500 (1) * 0900-1530 (3-4) 1530-1730 (1-2)	0600-1000 (3-4) 1000-1500 (2-3) 1500-1900 (4) 1900-0230 (2)	1700-0500 (4) 0500-0730 (2-3)	1830-0430 (3)
South America	1030-1600 (1) * 0800-1500 (3) 1500-1700 (3-4)	0600-0800 (3) 0800-1530 (2) 1530-1900 (4) 1900-0300 (2)	1800-0600 (3-4)	1900-0500 (2-3)
Japan & Far East	NIL	0630-0900 (1) 1500-1900 (2-3)	0030-0800 (2)	0200-0700 (1)
South East Asia	1500-1700 (0-1)	0630-0900 (0-1) 1500-2000 (1)	0100-0800 (1)	0300-0600 (0-1)

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Hawaii	1300-1800 (1-2)	1000-1900 (2-3) 1900-2100 (3-4)	2130-0900 (3-4)	2300-0730 (3-4)
Australasia	1600-1800 (1)	0630-1000 (2-3) 1000-1900 (1) 1900-2100 (2)	0000-0800 (3)	0100-0700 (2-3)

ALL TIMES IN PST

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	NIL	0700-1300 (1-2)	1800-0100 (1)	1900-0000 (0-1)
Central & South Africa	1000-1500 (1)	0630-1500 (1) 1500-1800 (2)	1700-2200 (2-3) 2200-0030 (1)	1800-2200 (1-2)
South America	1000-1600 (1) * 0800-1300 (2-3) 1300-1700 (3-4)	0600-0800 (3) 0800-1400 (2) 1400-1830 (4) 1830-0100 (1-2)	1700-0400 (3-4)	1800-0300 (2-3)
Guam & Mariana Islands	1300-1700 (1) * 1400-1900 (2-3)	0630-0900 (1) 1130-1900 (2) 1900-2200 (3)	0100-0900 (3)	0200-0730 (2)
Australasia	1400-1900 (1) * 1130-1900 (2-3)	0630-0900 (1) 0900-1100 (2) 1100-1730 (1) 1730-2100 (2-3)	2200-0800 (3)	2300-0700 (3)
Japan, Okinawa & Far East	1400-1930 (2)	1200-1800 (2-3) 1800-2100 (3-4) 2100-2200 (1-2)	2230-0800 (3)	0030-0600 (2-3)
Philippine Islands & East Indies	1400-1800 (1)	0800-1100 (1-2) 1100-1300 (0-1) 1300-2100 (1-2)	0100-0630 (1-2)	0300-0500 (1)
Malaya & South East Asia	1600-2000 (0-1)	0800-1100 (0-1) 1600-2200 (1)	0400-0700 (1)	0500-0630 (0-1)
Hong Kong, Macao & Formosa	1500-1930 (1)	1500-2200 (2-3)	0100-0600 (2-3)	0200-0500 (1-2)

Symbols for Expected Percentage of Days of Month Path Open:

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

* Indicates time of possible ten-meter openings.

The CQ Propagation Charts are based upon a CW radiated power of 150 watts and are centered on Washington, D. C., St. Louis, Missouri and Sacramento, California. These forecasts are, for the most part, calculated from basic ionospheric data published by the CRPL of the National Bureau of Standards, and are valid until April 15th, 1955.

Ionospheric Propagation Conditions

Forecasts by
George Jacobs, W2PAJ/W3ASK
607 Beacon Road, Silver Spring, Md.

General Propagation Conditions — March

6 Meters A seasonal increase in Auroral activity may reult in an occasional "aurora type" opening on this band.

10 Meters Ionospheric conditions remain poor on this band, but occasional north-south DX openings expected on propagationally good days. Short-skip openings may occur during periods of Auroral activity.

15 Meters Generally fair daytime DX conditions expected to continue through March and into early April. Short-skip openings will begin at approximately 900 local time with the minimum skip decreasing to about 1200 miles by 1500. The band is expected to go "dead" by about 1800 local time.

20 Meters Fair to good world wide DX conditions continues from shortly after local sunrise to somewhat after local sunset. The band will remain open longer as the summer months approach. Short-skip is expected to begin about 660 local time with the minimum skip out about 1600 miles. The minimum skip distance will decrease to about 700 miles by noon, increasing out to 2000 miles by 2000 local time. The band is expected to close for everything but an occasional north-south DX opening by approximately 2100 local time.

40 Meters Seasonal ionospheric absorption and atmospheric noise levels (static) increasing on most circuits, but generally fair to good early evening and night-time DX expected. During the night-time hours minimum skip distance will be about 1000 miles. During the daylight hours ionospheric absorption will limit propagation to within about 700 miles from the transmitter.

80 Meters Generally fair DX conditions continue to many areas of the world, especially Australasia, from shortly after sunset to shortly after sunrise local time. Static level increasing and signals will be weaker than during the winter months. During the daylight hours ionospheric absorption will limit propagation to about 300 miles from the transmitter.

160 Meters Static and ionospheric absorption increasing, but some night-time DX may be possible during periods of low atmospheric noise levels. Theoretically optimum conditions exist on this band during March for circuits to Australasia. Because of extremely heavy ionospheric absorption no skip possible during the daylight hours and propagation is limited to a few miles from the transmitter (groundwave).

This overall picture of band conditions is intended to indicate qualitative changes in each amateur band from month to month. In addition, beginning with this month's column there is also included a discussion of general skip conditions on each band as well as the usual DX forecast.

For specific times of band openings for a particular DX circuit refer to the *CQ Propagation Charts* on the opposite page.

This month's *Charts* are based upon a predicted smoothed sunspot number of 12, centered on March, 1955. The monthly Zurich sunspot number reported for December, 1954 was 7.3 resulting in a provisional Zurich 13 month running smoothed sunspot number of 4.1 centered on June, 1954. This indicates a small increase over sunspot activity observed for May and the sun spot numbers appear to be on the *increase* again as a new cycle begins.

Equinoctial Period

March 21 is the occasion of the Vernal (spring) Equinox. This is the day when the sun crosses the equator as it travels towards northern skies. On this date, day and night throughout the world are of equal length. This solar phenomena has considerable effect on shortwave propagation conditions. This period (approximately from early March to mid April) usually marks the changeover from winter to summer propagation conditions in the northern hemisphere. Maximum usable frequencies during the daylight hours are decreasing and maximum usable frequencies during the night-time hours are increasing. Ionospheric absorption, resulting in weaker signals, and atmospheric noise levels (static) are also increasing.

FLASH

Significant Ionospheric disturbances are forecast for March 12-16 and March 22-24.

Auroral activity also increases during the equinoctial period. This usually results in some of the severest and longest ionospheric disturbances of the year occurring during March. An increase in aurora type openings on the HF and VHF amateur bands are also usually associated with this period.

In the southern hemisphere, however, the opposite effects are taking place. It is autumn in that part of the world and the shift is from summer to winter propagation conditions. On radio circuits extending from the northern to the southern hemispheres (for example, from the United States to New Zealand) there is a balancing effect during the equinoctial period. On these circuits *overall* ionospheric absorption is usually at its lowest values of the year and the average static levels are also generally at their lowest values. This tends to result in an improvement in overall shortwave propagation conditions on most amateur bands for these circuits during this period. An improvement on 40 and 80 meters should be especially noticeable, with many more southern hemisphere signals expected to be heard on these bands than were heard during the night-time hours of the winter months. For these reasons there is also the possibility that March may prove to be the best month for 160 Meter DX on circuits to the southern hemisphere.

Skip Effect

During the past few months many readers of this column have suggested that these forecasts be expanded to include some data concerning short-skip conditions on each amateur band in addition to the regular DX forecasts. The DX forecasts are of course based upon multi-hop propagation conditions. Beginning with this month there is also included in the general discussion of short-

[*Continued on page 58*]

DX and Overseas News

Gathered and reported by

R. C. "DICK" SPENCELEY, KV4AA

Box 403, St. Thomas, Virgin Islands.

COCOS ISLAND, TI9: W6MHB, John, should be very much in evidence with a TI9 call as this is read. He sailed from San Diego on January 8 aboard a converted 110 foot sub chaser and should have made an appearance on the air from TI9 around February 1. Part of the rather impressive array of equipment for this expedition includes a VIKING II, NC-183, One 2½ kw. and one 1½ kw. gas driven generators. CW activity is planned on the low edges of all bands, ten to 160 meters.

CRETE, SV1AZ: This station has been quite active between 14080 and 14105 working W2YW, W88KP, W3JNN and many others. He gives his QTH as Box 15, Candia, Crete.

VATICAN CITY, HV1OR: Via CN8MM and other sources we hear that DL4OR has obtained a license to operate as HV1OR between February 14 and 16 and February 26 to 28. Sure hope this one comes off!

AUSTRALIAN ANTARCTICA, VK1: VK1AC, VK1GA and VK1DJ who held down Macquarie Island in '54 arrived back home in Australia in January. Calls heard from Macquarie in '55 will be VK1DC and VK1ZM. Heard Island's VK1DY, VK1PG and Antarctica's VK1EG are due home in February or March. 1955 calls from the Mawson Antarctic base will be VK1RA and VK1AWI. No further ham activity is expected from Heard Island. (Thanks VK3CX).

ALBANIA, ZA1BB: This station was due to go QRT on Dec. 1. Altho unlicensed, according to SP3AN, we imagine his QSL's will be OK when and if, they come through. An outside expedition to ZA is in the wind and, while we cannot mention details at this time, it has a fair chance of becoming a fact!

MADAGASCAR, FB8BR: This station has been quite active around 14040 (VFO) handing out Zone 39 contacts. Hubert was due to have a new 120-watt 4-65A, rig on the air by mid-January. Previous contacts at FB8BR were made with a 6V6 VFO!! (Thanks K2GFQ).

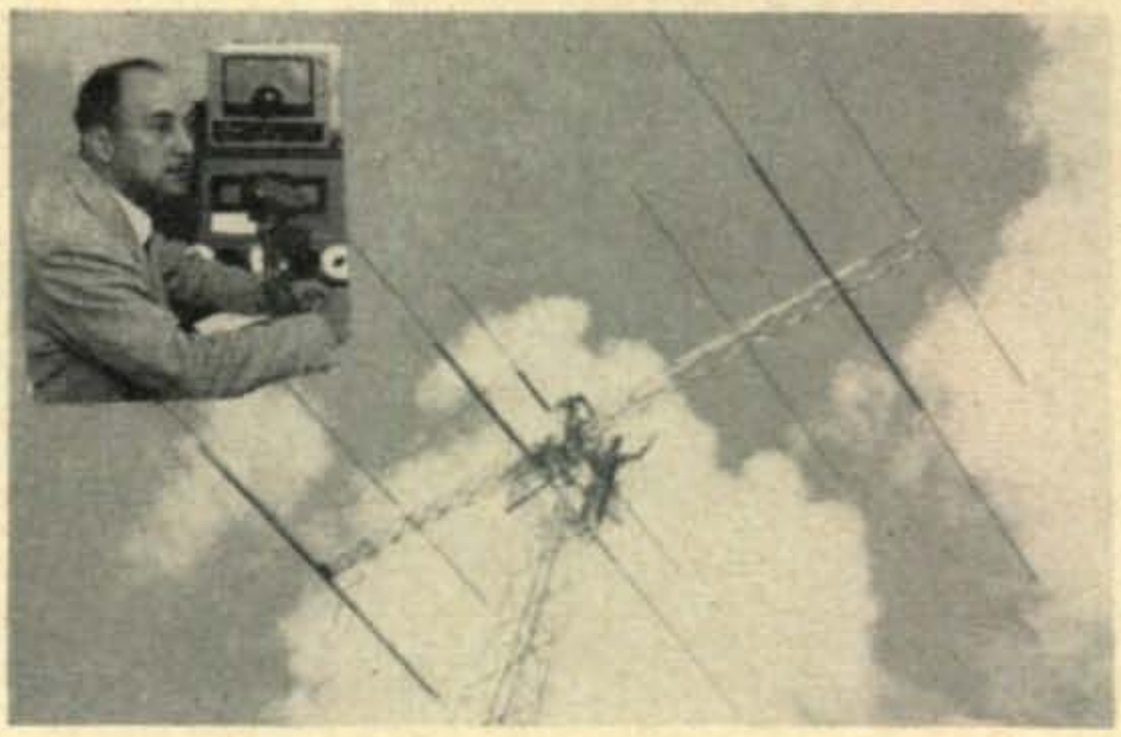
FLASH!

Via W4KVX we have news of G8FC's far east trip which is presently in progress. The call used will be **G3IDC** followed by the prefix of the QTH operated from. Frequencies will be 21025, 14025, 14090 and 7025 and calls should be made 5 kc higher. A power of 25 watts will be used. Itinerary is as follows: **Cyprus/ZC4** Feb. 13th to 16th, **Aden/VS9** Feb. 17 to 23rd, **Ceylon/4S7** Feb. 24th to Mar. 2nd, **Malaya** Mar. 3rd to 7th, **Hong Kong/VS6** Mar. 9th to 14th, **Singapore/VS1** Mar. 16th to 21st, **New Zealand/Z12** Apr. 1st to 3rd, **Australia/VK2** Apr. 4th to 10th, **Singapore/VS1** Apr. 17th to 21st, **Pakistan/AP2** Apr. 23rd to 26th. Along the route G8FC also intends to set up shop at any other rare DX spot that may be reached, time permitting. . . . As this is written W6MHB is in Costa Rica and advises that **TI9MHB** should be on the air about Feb. 8th. . . . Either VR2BZ or VR2AB was scheduled to visit **Tokelau/ZM7** for a three day stay around Feb. 1st. . . . Hope you got 'em! . . . Qatar was again heard from when **MP4QAJ** was on 14060, Jan. 30, 1500 GMT. QAJ shuttles back and forth between Qatar and Lebanon, where he has an OD5 call, so repeat performances are probable. . . . Tony, **MP4QAH**, recently lost most of his transmitting gear when the shack caught fire and will probably not be heard from for some time. . . . French Togoland is again represented by **FD8AA** who was overheard QSO'ing W4KVX on 070 at 1745 GMT. He was also heard on 040 and promises activity in the DX contest. . . . **JZØKF** may now be reached at: H. Schrier, Wakkerstrig, Amsterdam (O). Holland (Tks W8MPW). . .. W6WTJ and KH6OR sked KP6AK most nights at 0200 GMT. **KP6AK** is on 14128, 240 and 250 (West Gulf Bulletin) . . . Via W6AM and MP4QAH we learn that the call, **MP4ABW** (Claiming to be in Qatar), is **illegally used** in that area and **he does not QSL.** . . . The Jan. 15th/16th North and South Cal. get-together was attended by 104 hams and a swell time was had by one and all. Among the guests were VK2US, W9IOP, WØBFY, W9YFV, FO8AD, EA2CA/EA9DE, W9VND, T12TG and W5ENE. Slides from the FO8AJ expedition were shown with W6AM as narrator while WØBFY gave a preview of "things to be" at COLLINS. . . . W6VUP, W6OXS and W6OCA plan a flying trip to the West Indies this summer with hope of operation in such spots as PZ1, VP3, VP2, FG7 and HI. A Viking Ranger may be used. . . . W8UAS nailed **LB1LF**, Jan Mayen, 022, 1315 GMT.

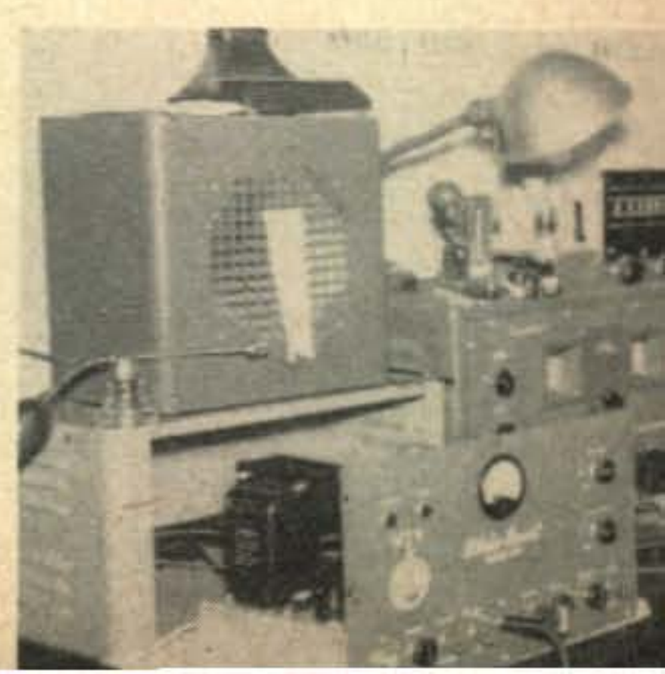
A view of the "traveling" Freeman family during their recent tour of the USA which commenced in Vancouver on August 1, ended in Los Angeles on October 19, and covered 32 states. A 28-Mc rig was taken along under the call of VE7ASL/W. Charley may be better known as ex-ZL4FH/ZL3AE/ZL1BI or VR2CD. He may now be reached via Box 1378, Honolulu, T.H., where VE7ASL/KH6 will be used until a regular KH6 call is assigned.

Juan, EA2CA, contemplates portable operation. Photo was snapped during Juan's 1954 stay in Rio De Oro as EA9DE. His friend obviously takes a dim view of all these shenanigans.

PY4CB, Homero Braga Fontes, of Juiz de Fora, Brazil, runs a kw. to PP 450TL's. Receiving is done using a HQ-129X with pre-selector. Homero has amassed 170 countries on phone. A seventy-foot mast supports the three element 14-Mc beam and four-element 28-Mc array. Zepps are used on 3.5 and 7, while a dipole does the job on 21.



A wandering group of troubadours, armed with a flash camera, staggered up to the front door at W6TI's domicile during the wee hours and here's what they got . . . we know just how Horace feels. (Photo courtesy North Calif. DX Bulletin.)



W4BXI, John Drum, Richmond, Va., runs fifty watts to a doublet. John, 16, has acquired an early start along the DX trail.

DX Notes

VK3CX reports that VR2BZ/ZM7's second trip to Tokelau, December 14th, resulted in only two hours operation there. Conditions were very poor with only a few W6 and other assorted stations worked. Bari is due to retire from the Air Force early this year. . . . From Thailand a newspaper article states that a bill to legalize ham radio in Siam will come before the Thai parliament when it convenes in May. . . . Cards for FG7XB may go via Chuck, W4LVV, who is having a batch made up for him. Please include stamped, self-addressed envelope for return QSL. . . . West Gulf Bulletin notes follow: DL2XP will furnish any missing VU5AB, Andaman Island, QSL's. PK6AY is due on soon from the same QTH as JZØKF. KH6OR planned several days activity from KM6 around mid-January. W5FXN says that W5OZI goes to Turkey in March or April. CN8MM advises that AC4LM is a new station in Tibet and may be found on 14270 kc. CR8AB is said to be on daily at 1800 GMT, 14170. CR8AC is also active. ZC5SG may be heard on 14050, CW, Sundays only. WØAIW has dispatched a new rig to Gus, FP8AP, which runs a pair of 811's modulated by 811's. . . . VP5AE, Turks and Caicos, say that a quick QSL may be obtained by sending a stamped, self-addressed, envelope to Major Dow E. Evelyn, Grand Turks Island, c/o PAA, Patrick AFB, Florida. Present "legit" stations in Nyasaland are: ZD6JL, ZD6RD, ZD6BX, ZD6HN, ZD6HJ and ZD6EF. EL2X advises that FE8AE will definitely be on 14 Mc., CW only, starting January 20th. YN4CB says plans are being made for an expedition to Corn Island! VP8AQ moves to the South Shetland group in February. VU2JP and VU2RC sked AC4NC every Sunday at 0500 GMT (Pretty sure this is phone). CR8SA is reported active. CN8MM skeds PX1YR daily at 2000 GMT, A3. EP3SS, Iran, should be legally licensed soon (This may result in the ban being lifted!). EL2X say CR8SA, just mentioned, may be found on 14053. Ray goes on to mention the following: FL8AI is on daily, 1800 GMT, 14150. FB8BL, 14195. ZS2MI, 14109, 1730 GMT, Wednesdays and Sundays. Red, ZD9AA, is now in ZD2-land and may be heard occasionally from ZD2DCP. . . . ZC3AC, Christmas Island, had receiver trouble and sent it to Singapore for repair. Might have it back by now. . . . VP7NX visited ZD7-land but no license. He may go back again after March and may also be heard from VP2. . . . W1JRA looks good from YA-land from February to May! . . . HA5KBA has a potent signal on 14, 7 and 3.5 (750 watts) and ops Bandi and Lacy are doing a good job dispensing QSO's. . . . W5YLL says KS4AV/W4NXE/KS4 is now W5HQT in El Paso, Texas. . . . The call, MD5EU, seems to have been pirated. The only legit W QSO's with MD5EU, last May 5th., were with WØDXE, WØIDI, W5BNO and W8EV. . . . Ray, ex-MP4BBD, was refused license in DU-land but will try again. . . . W8BKP, via VQ4FK, reports that VQ4NZK, not yet ready for VQ9 (Could be due around now tho—). . . . Vic, HKØAI, has been appearing on 14 Mc. phone. . . . Navassa light is now being taken care of via Miami which hampers KP4TF's plans for KC4 activity. . . . Via KP4AAO we hear that CN8EB plans trip to an EA9 spot. More later. . . . W6NGA snagged OY2A, 14051, 1550 GMT. . . . VP7MN reports VP7MI and VP7SL as "pirates." . . . W6RW reports M1L (San Marino) on 14058. He says QSL via M1B. (Box 8, San Marino). . . . Arne, LB1LF, Jan Mayen, was heard on 14022 at 1340 GMT RST 579 at KV4AA. . . . HS1D, Jim, should now be heard as W4VHL, Elgen AFB, Florida. . . . MP4QAJ is OD5AF and seems to commute between Qatar and Lebanon. . . . W2-SWL, Ben Adams Jr. relays the word that CO4HT, Isle of Pines, may be found on the low end of 75 around 0400 GMT. He runs 400 watts on phone.

Congratulations are in order for the following stations who have just joined the WAZ ranks:

No. 303 ROBERT WAGNER,
W5KUC 40-251
No. 304 WILLARD TALLMON,
W6DVB 40-104

Bob is the fourth W5 to attain WAZ while Willard is the 116th W6!

We also welcome the following newcomers to the HONOR ROLL:

W8UAS 38-215
W8YIN 35-176

160 Meters

The second Transatlantic test, Dec. 19th, presented the best conditions to date. The following overseas contacts were reported by W1BB: W2QHH/EI9J-G5JU, W8KIA/YV5DE, W1ERX/G5JU, W1EPE/G2AJ-EI9J-G5JU, W1ORP/EI9J, W2GGL/YV5DE, W9PNE/YV5DE, KV4AA/EI9J, W1BB/G5RI-TI2BX-G2AJ.

Test number three, January 2nd, got off to a slow start with a few weak signals heard at 0500 GMT. After 0600 GMT the band opened with a bang and it was hard to believe that one was on 1.8 instead of 7 Mc. W stations were peaking S9 in the Caribbean area while G5RI went to 579 at W1BB! Contacts were as follows: W1BB/T12BX-G2AJ — EI9J-G5JU-G6GM, KP4KD/G5RI-G5JU-G2AJ-EI9J — W2QHH/EI9J-G5RI, W1BMW/G2AJ, KV4AA/TI2BX-G5RI-EI9J-G6GM-G5JU-G2AJ also heard by OK1HI), W9PNE/ZL3RB. G signals fell short of W9-land with G5RI and G2AJ being heard with poor signal strength at W9PNE. KP4KD is heard consistently by DL1FF, 57/89. W1BB's activity on 160 has resulted in WAC and a total of 28 countries. Stew expresses the hope that activity on this band will be confined to the joy and fun of DX'ing, testing equipment, antennas, studying propagation conditions, etc. in a friendly NON-competitive way rather than to have the band degenerate into a rat-race of "who has the most countries" attitude. There has been some signs of this and some old-timers, discouraged by this trend, have ceased activities. While the ham bands are free for everyone to pursue the type of operating he likes best we think that there is enough of this stuff on the other bands to satisfy anyone so inclined. A report from Shely,

[*Continued on page 64*]

Helvetia-22-Contest

THIS SWISS CONTEST will be held from 1500 GMT, March 19th to 1700 GMT, March 20th. It will give all hams another chance at the HELVETIA-22 Award which may be obtained by submitting proof of QSO with each of the 22 Swiss cantons as listed below. All contacts on bands from 28 Mc. through 3.5 Mc. will count 3 points. Multiplier is the sum of cantons worked on all bands. Six numeral figures are exchanged giving RST and number of contact. CW and phone will be used. Mail logs by March 31st to HB9CZ.

SWISS CANTONS

Zurich	ZH	Grisons	GR	Argovie	AG
Berne	BE	Zoug	ZC	Thurgovie	TG
Lucerne	LU	Fribourg	FR	Tessin	TI
Uri	UR	Soleure	SO	Vaud	VD
Schwyz	SZ	Basle	BS	Valais	VS
Unterwald	NW	Schaffhouse	SH	Neuchchatel	NE
Glaris	GL	Appencell	AR	Geneva	GE
		St. Gall	SG		

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the Novice Shack

Conducted by

Herbert "Herb" S. Brier, W9EGQ

385 Johnson Street, Gary 3, Indiana

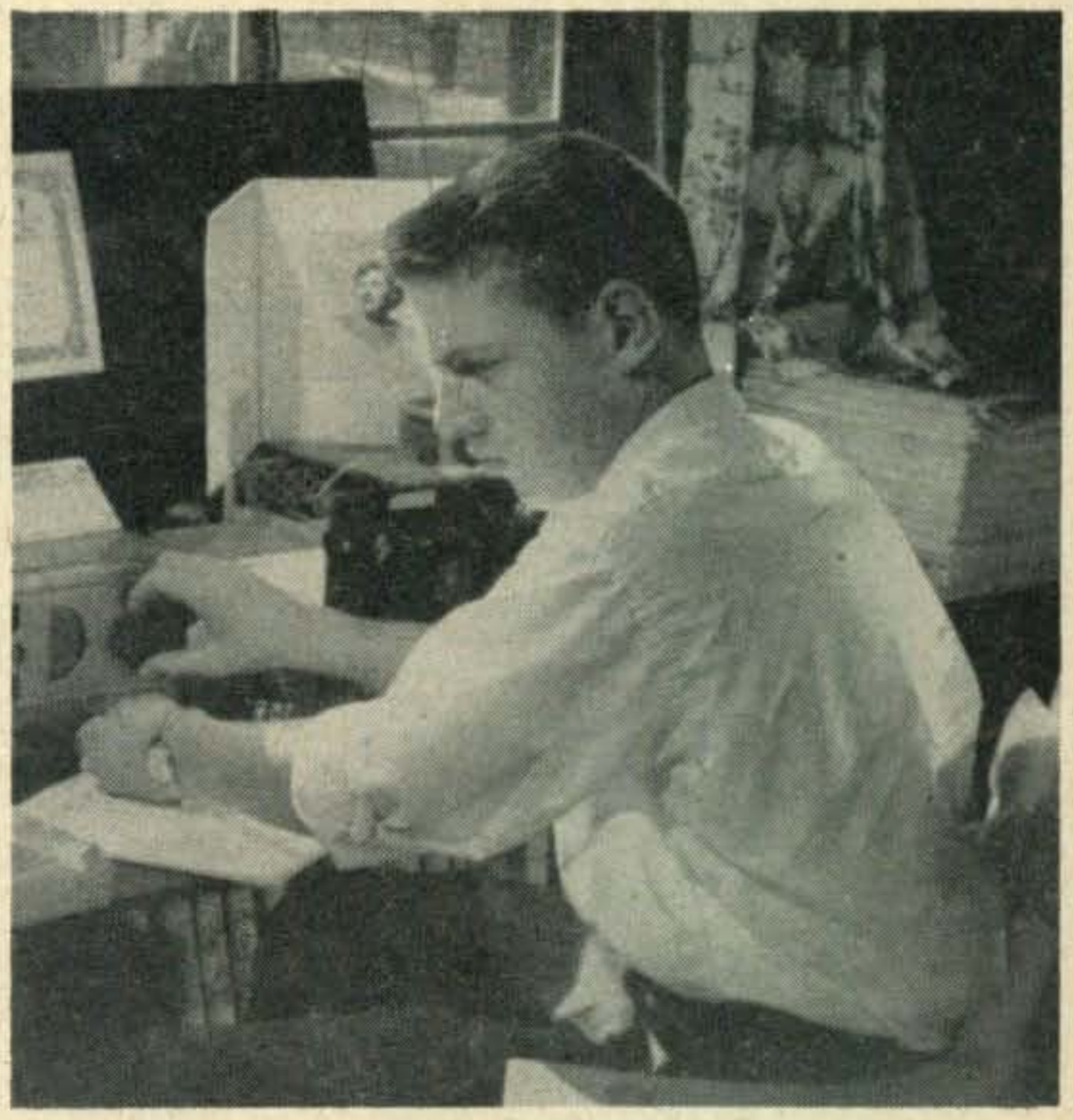
In the *Novice Shack* for January, 1955, I discussed techniques helpful in working the 48 states in the United States (WAS). This month, I shall discuss working DX, considered by many the most fascinating phase of amateur radio. To establish a basis for discussion, I shall define the term *DX*. Not everyone will agree with the definition but I think it is a reasonable one for amateur frequencies below 30 mc.

A DX station is any amateur station at least 2,000 miles away and located outside of one's own country.

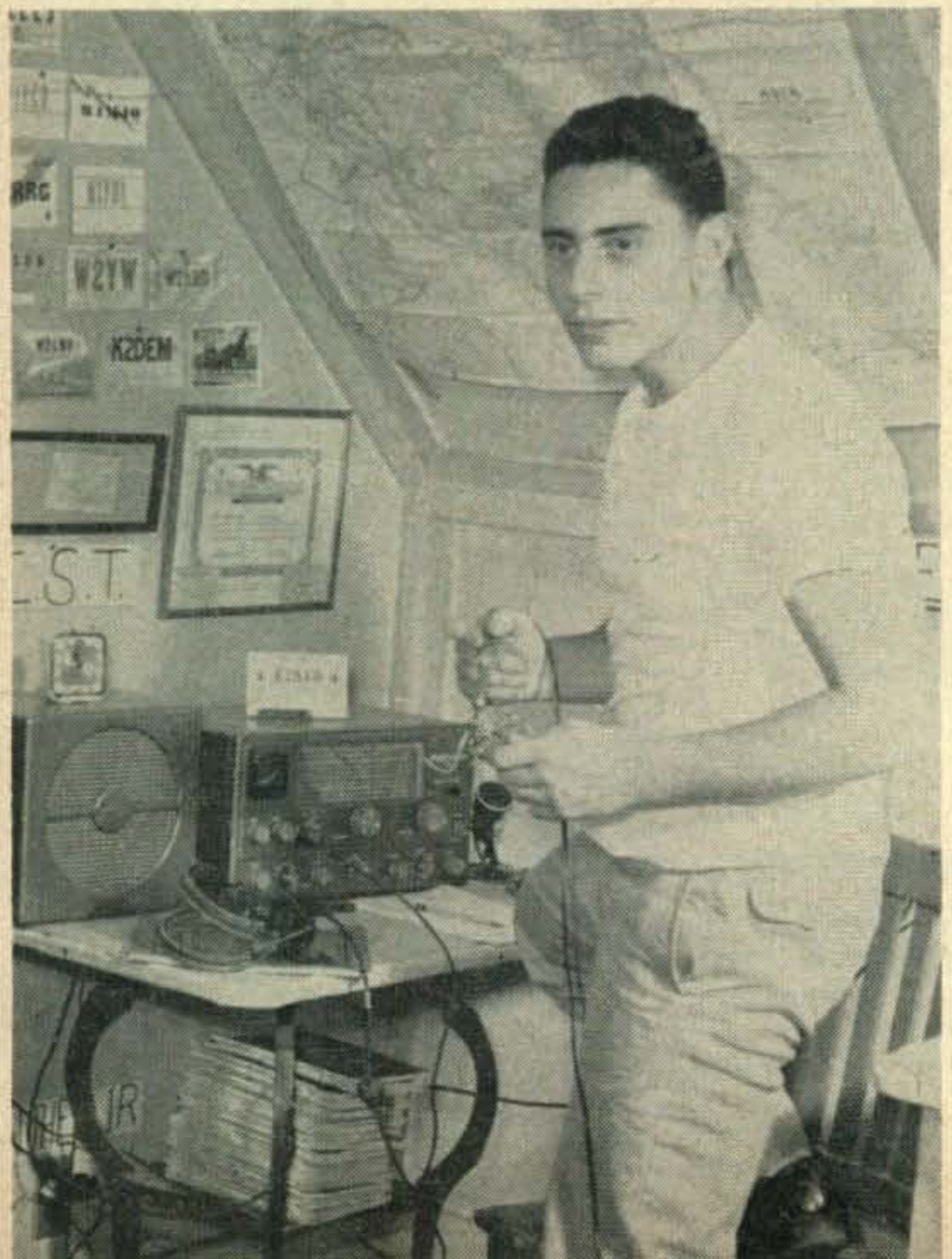
Far more important than the distance that must be covered in working DX is the competition that must be faced. When conditions to the United States are favorable, a CQ by an amateur in one of the "common" foreign countries, such as England or France or the more-populated South American countries, will often elicit ten or more replies. Under similar conditions, a CQ from a "rare" country, such as Zanzibar or Cocos Island, usually creates an explosion of apparently a thousand replies, all on the same frequency.

Suggestions For Working DX

1. *Listen, listen. listen!* You cannot work any station, DX or local, until you hear it. Although there are many exceptions, signals that have travelled thousands of miles are generally weaker than signals that have traveled shorter distances. Therefore, unless you pay attention to the weak signals under the top layer of strong ones, you will pass by many workable DX stations. With practice, you will often be able to distinguish a DX signal from a weak local, as soon as you hear it, by the indescribable wavering, "watery" characteristic which signals that have traveled great distances often acquire.



John Thompson, WN8SAQ, Cincinnati, Ohio, has received confirmations from the 25 states which he has worked with his 25-watt transmitter and S-38C receiver.



Listen on the right band at the right time. W2PAJ's monthly Propogation Forecasts in *CQ* are most helpful in picking the times to listen. Of course, you will not hear a bunch of rare DX stations every time the charts predict a particular path will be open. Nevertheless, your chances will be better at the predicted times than any other.

Listen in the right portion of the band. This applies in particular to 80 and 40 meters. Only in North and South America are these bands assigned in their entirety to amateurs. In the rest of the world, they are cluttered up with commercial signals. Consequently, most DX stations who operate on these bands are found within 50 to 100 kilocycles of 3.5 and 7 Mc. This explains in part why it is so difficult to work much DX in the 3.7- and 7.2-Mc. Novice bands.

When you hear another station calling a DX station,

Henry Adelson, K2BAH, Richmond Hills, N.Y., has worked fifteen states on 7.2 Mc., with eight watts to a one-tube transmitter. His best miles-per-watt record is 1500 miles with five watts.

listen carefully on or near that frequency, and you will probably hear the DX station replying. Wait until the contact is finished, and call the DX station yourself. However, others will do the same thing; therefore, your percentage of replies from DX located in this manner will be lower than from DX you locate without help.

2. *Call DX stations on the frequencies and in the manner that they dictate.* Most c-w DX stations reply to calls only on their own frequencies. Consequently, it is often a waste of time to call them, unless you can get within a kilocycle of that frequency. However, do not assume that every DX operator follows this practice. A few of the smarter ones seldom answer calls on their own frequencies.

The latter present about the only "break" a low-power station gets in working DX. Many operators automatically "zero beat" the frequency of all stations they call. This gives an alert operator a chance to move a few kilocycles off of the pile-up frequency and work a new country, before they figure out what has happened. Confidentially, some of them never do.

Few DX phone stations operate inside the USA phone bands, making it impossible to "zero in" on them. Instead, most stations calling them crowd toward the edge of the band. This frequently creates so much mutual interference that the DX station can copy none of them. Consequently, he tunes further into the band searching for a call from a station not completely covered up. For this reason, a low-power phone station normally has a better chance of working DX by staying away from the band edges.

This is the only important difference between working DX on phone and on CW, except that it is much harder to do with low power on phone than on CW.

Do not make your calls too long. A call to a DX station need be no longer than one to any other station. If one short call does not get results, you can always call again. Besides wasting time, too long a call has another disadvantage. Your loud signal, repeating the DX call letters over and over again, shouts to the rest of the gang, "Look! I found one." It is a fine way to alert them.

Once you have raised a DX station, be even more sparing in sending its call letters. If you believe that the DX operator needs a long call in order to tune you in (and he probably does not), repeat your own call letters a few times. They will attract less unnecessary attention.

Call and work DX at the speed used by the DX station or at your regular speed, whichever is slower. Avoid the exaggerated, drawn-out sending affected by some operators when calling DX. It is hard to copy and again tips off your competition that you are on the trail.

3. *Do not call a DX station merely because you hear someone else doing so.* It is easy to be led into this foolish trick. One way is for someone, who is working a DX station, to end his second-to-last transmission with *SK*, instead of the correct *K*. An over-eager member of the gang waiting to work the DX station hears the *SK*, and without waiting to see what the DX station does, starts his call. Others hear him and start calling, too. As a result, the DX station's final transmission is buried under a flood of useless calls.

The funniest thing about the whole act is that, once started, it is self perpetuating. As one caller stands by, two more take his place. It is not unknown for the DX station to move to another frequency without the callers realizing for quite a while that he has left the party.

In spite of your best intentions, you may occasionally call a DX station at the wrong time, if it suddenly fades out, or if interference covers it up. When you do, you will feel foolish, but do not let it worry you, as long as it does not become a habit.

4. *CQ DX.* Most articles on how to work DX stress that CQ DX is usually a waste of time for the low-power station. True as that is, you probably will not believe it, until you have tested it. Percentages are against you. Why should a DX station reply to your CQ, when one of his own will give him many calls to choose from?

I could offer other tips on working DX, but you will quickly learn most of the tricks, especially if you refrain from calling every DX station you hear. Instead, observe how other operators chase them. Analyze what you hear by asking yourself, "If I were a DX station, is that the type of call I would answer?" remembering that you would have dozens of calls to choose from. Soon you will begin to see why different operators with apparently

Carl Shenk, WN4HBC, on uninhabited Navassa Island in the West Indies. Carl became the envy of many U.S. DX chasers who have dreamed of being "rare" DX by making his first contact from the DX-pedition station, KC4AB, on the Islands.

identical stations often have entirely different results chasing DX.

I hope I have made it clear that DX chasing demands both skill and patience but is extremely fascinating. In fact, I must warn you that some operators get so involved in it that they act like Marines storming a beachhead while they are DX'ing. Do not take it that seriously, because your hobby then becomes work, instead of fun.

News For And About Novices

Chas M. Morenus, KV4BK, P. O. Box 618, Christiansted, St. Croix, Virgin Islands, a ham for 43 years, writes, "If you want to help me inject a little of the fatal DX virus into the Novice blood, you can mention in the *Novice Shack* that I call CQ WN every morning about 1030 GMT (5:30 a.m., EST) just outside the low-frequency of the 7-Mc. Novice Band.

"As I have to leave for work about 1100GMT, I hope the boys will keep contacts short; so that I can work more than one of them a morning. My RST and their name and town is enough. They don't have to waste time sending their full addresses and telling me I am their first

[*Continued on page 44*]

A good receiver is more important than a high-power transmitter in working DX. Skilful operating by W4VZQ, W4QCW, and WN4HBC resulted in over 600 contacts in the first 24 hours of operation of DX-pedition station, KC4AB, on Navassa Island last August.

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Same day shipment!

NUMBERS LISTED ARE FUNDAMENTAL FREQUENCIES IN KILOCYCLES

FT-243

Lots of 10 or more. Each..... **69c**

Lots of 5 or more. Each **79c**

Individually. Each **99c**

1015	2795	3955	6185	7473.3	7908.3	8325
1110	2815	3980	6200	7475	7910	8330
1129	2825	3990	6206.6	7483.3	7916.7	8333.3
1150	2830	3995	6225	7491.7	7920	8340
1195	2835	4045	6235	7500	7925	8341.7
1525	2840	4095	6240	7506.6	7930	8350
1900	2845	4110	6250	7508.3	7933.3	8358.3
1915	2850	4135	6273.3	7510	7940	8360
1930	2855	4175	6275	7516.7	7941.7	8366.7
1940	2860	4215	6300	7520	7950	8370
1950	2865	4220	6306.6	7525	7958.3	8375
1965	2870	4255	6315	7530	7960	8380
2015	2875	4295	6325	7533.3	7966.7	8383.3
2017	2880	4300	6335	7540	7970	8390
2020	2885	4330	6340	7541.7	7973.3	8391.7
2025	2890	4340	6350	7550	7975	8400
2035	2895	4395	6362	7558.3	7980	8406.6
2040		4445	6373.3	7560	7983.3	8408.3
2055	2905	4450	6375	7566.7	7990	8410
2060	2910	4495	6405	7570	7991.7	8416.7
2065	2915	4535	6406.6	7573.3	8000	8420
2090	2920	4540	6425	7575	8006	8425
2105	2925	4580	6440	7580	8006.6	8430
2125	2930	4610	6450	7583.3	8008.3	8433.3
2130	2935	4620	6473.3	7590	8010	8440
2135	2940	4635	6475	7591.7	8016.7	8441.7
2140	2945	4680	6500	7600	8020	8450
2195	2950	4695	6506.6	7606.6	8025	8458.3
2300	2955	4710	6525	7608.3	8030	8460
2305	2960	4735	6540	7610	8033.3	8466.7
2320	2965	4780	6550	7616.7	8040	8470
2350	2970	4785	6573.3	7620	8041.7	8473.3
2355	2975	4815	6575	7625	8050	8475
2360	2980	4820	6600	7630	8058.3	8480
2365	2985	4840	6606.6	7633.3	8060	8483.3
2370	2990	4845	6625	7640	8066.7	8490
2375	2995	4852	6640	7641.7	8070	8491.7
2390	3005	4880	6650	7650	8073.3	8500
2415	3010	4900	6740	7658.3	8075	8506.6
2430	3015	4930	6773.3	7660	8080	8508.3
2435	3020	4950	6815	7666.7	8083.3	8510
2440	3025	4995	6840	7670	8090	8516.7
2441	3030	5035	6873.3	7673.3	8091.7	8520
2450	5035	5090	6906.6	7675	8100	8525
2455	2040	5127.5	6940	7680	8106.6	8530
2460	3045	5165	6973.3	7683.3	8108.3	8533.3
2465	3050	5180	7000	7690	8110	8540
2470	3055	5235	7006.6	7691.7	8116.7	8541.7
2475	3060	5245	7025	7700	8120	8550
2480	3065	5285	7040	7706.6	8125	8558.3
2485	3070	5295	7050	7708.3	8130	8560
2490	3075	5305	7073.3	7710	8133.3	8566.7
2495	3095	5327.5	7075	7716.7	8140	8570
2505	3100	5335	7100	7720	8141.7	8573.3
2510	3110	5385	7106.6	7725	8150	8575
2515	3130	5397.5	7125	7730	8158.3	8580
2520	3135	5435	7140	7733.3	8160	8583.3
2525	3140	5545	7150	7740	8163.4	8590
2530	3145	5582.5	7160	7741.7	8166.7	8591.7
2535	3150	5587.5	7173.3	7750	8170	8600
2545	3155	5645	7175	7758.3	8173.3	8606.6
2550	3160	5687.5	7200	7760	8175	8608.3
2557	3165	5730	7206.6	7766.7	8180	8610
2560	3170	5760	7225	7770	8183.3	8616.7
2565	3175	5775	7240	7773.3	8190	8620
2570	3200	5782.5	7273.3	7775	8191.7	8625
2575	3202	5800	7275	7780	8200	8630
2580	3205	5820	7300	7783.3	8206.6	8633.3
2585	3210	5825	7306.6	7790	8208.3	8640
2590	3220	5850	7308.3	7791.7	8210	8641.7
2595	3225	5860	7316.7	7800	8216.7	8650
2650	3230	5892.5	7325	7806.6	8220	8658.3
2655	3235	5900	7333.3	7808.3	8225	8660
2660	3240	5907.5	7340	7810	8230	8666.7
2665	3290	5925	7341.7	7816.7	8233.3	8670
2675		5955	7350	7820	8240	8673.3
2680	3310	5975	7358.3	7825	8241.7	8676
2685	3320	5995	7366.7	7830	8250	8680
2690	3340	6000	7373.3	7833.3	8258.3	8683.3
2695	3410	6006.6	7375	7840	8260	8690
2705	3420	6025	7383.3	7841.7	8266.7	8691.7
2710	3455	6040	7391.7	7850	8270	8700
2715	3465	6042	7400	7858.3	8273.3	8706.6
2720	3500	6050	7406	7860	8275	8708.3
2750	3510	6073.3	7406.6	7866.7	8280	8710
2755	3525	6075	7408.3	7870	8283.3	8716.7
2760	3640	6100	7416.7	7873.3	8290	8720
	3655	6106.6	7425	7875	8291.7	8725

FT-243 Cont'd

2765	3680	6125	7433.3	7880	8300	8730
2770	3700	6140	7440	7883.3	8306.6	8733.3
2775	3760	6142	7441.7	7890	8308.3	8740
2780	3800	6150	7450	7891.7	8310	8741.7
2785	3885	6173.3	7458.3	7900	8316.7	8750
2790	3940	6175	7466.7	7906.6	8320	

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Lots of 10 or more. Ea. 99c

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YOUR CHOICE OF FREQUENCIES!

80 METERS 3701, 3702, 3703 through 3748 in steps of 1 KC.

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DOUBLING TO 40 METERS: 3588, 3589, 3590 through 3599 in steps of 1 KC.

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Low Frequency Crystals

Lots of 10 or more. Each..... **79c**

Lots of 5 or more. Each..... **89c**

Individually. Each **99c**

400	446	453	459	466	474
440	447	454	461	468	475
441	448	455	462	469	476
442	450	456	463	470	477
444	451	457	464	472	479
445	452	458	465	473	480

MISCELLANEOUS & SHIP BAND FREQUENCIES

81.95	KC. Octal tube type (Used in SCR-584 & SPM-1)		$3.99
200	KC. FT-241 CR2/U		1.99
200	KC. Type DC-15 in octal tube base type holder		1.99
327.8	KC. No. D - 168342. (Used in TS-102/AP)		9.95
500	KC. FT-241		1.99
1000	KC. Type DC-9, in octal tube base type holder		3.45
2000	KC. FT-243		1.99
2009	KC. DC-34		2.99
2110	KC. DC-34		2.99
2126	KC. DC-34		2.99
2142	KC. DC-34		2.99
2166	KC. DC-34		2.99
2174	KC. DC-34		2.99
2182	KC. DC-34		2.99
2182	KC. FT-243		2.99
2206	KC. DC-34		2.99
2500	KC. FT-243		1.99
2559	KC. DC-34		2.99
2567	KC. DC-34		2.99
2629	KC. DC-34		2.99
2632	KC. FT-243		2.99
2637	KC. DC-34		2.99
2637	KC. FT-243		2.99
2638	KC. DC-34		2.99
2638	KC. FT-243		2.99
2670	KC. FT-243		2.99
2647	KC. FT-243		2.99
2670	KC. DC-34		2.99
2738	KC. type 1-C		2.99
2738	KC. FT-243		2.99
2738	KC. MC-7		2.99
2891	KC. DC-34		2.99
2907	KC. DC-34		2.99
2951	KC. DC-34		2.99
2973	KC. DC-34		2.99
2977	KC. DC-34		2.99
2983	KC. DC-34		2.99
3000	KC. FT-243		1.99
3021	KC. DC-34		2.99
3023	KC. DC-34		2.99
3043	KC. DC-34		2.99
3053	KC. DC-34		2.99
3055	KC. DC-34		2.99
3088	KC. FT-243		2.99
3093	KC. DC-34		2.99
3093	KC. FT-243		2.99
3098	KC. FT-243		2.99
3103	KC. FT-243		2.99
3123	KC. DC-34		2.99
3125	KC. DC-34		2.99
3188	KC. FT-243		2.99
3193	KC. DC-34		2.99
3193	KC. FT-243		2.99
3198	KC. FT-243		2.99
3203	KC. FT-243		2.99
5000	KC. FT-243		1.99
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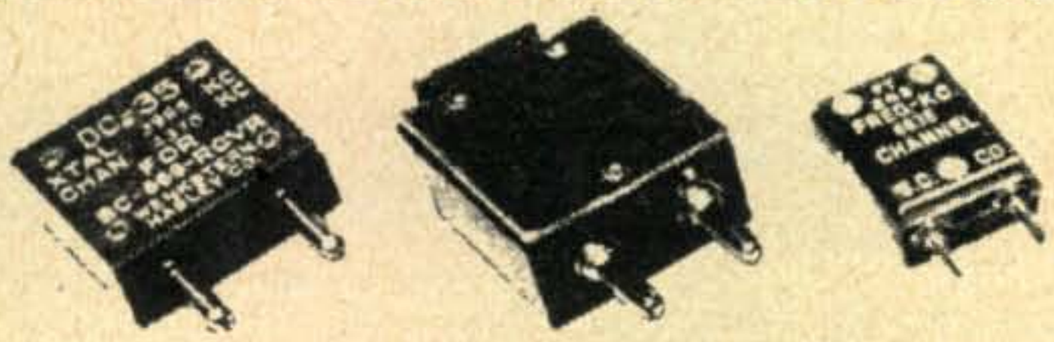

SPECIAL PACKAGE DEAL NO. 1 — $9.95

Regular value $69.00!

PACKAGE DEAL NO. 1 CONSISTS OF:

80 ..... FT-243
10 ..... DC-34-35
10 ..... FT-171

Shipping wt: 5¾ lbs.

100 CRYSTALS MIXED FREQUENCIES! AT LEAST 20 HAM BAND FREQUENCIES! TO OPERATE ON 160, 80, 40, 20, 10, 6, AND 2 METERS FOR OPERATION ON FUNDAMENTAL OR HARMONIC FREQUENCY.

SHIPPING TERMS: Check your postal zone and add sufficient postage to cover cost of mailing.

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GUARANTEED TO OSCILLATE! Consists of 5 choice crystals:

1—ZENITH MODEL DC-18-A 1,000 KC CRYSTAL: Built-in 12 V. automatic thermostatic controlled heating unit. 8-pin octal base. Regular value $5.95
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1—FT-243. 5,000 Kc. Reg. value 1.99
1—DC-15. 200 Kc. Reg. value 1.99
1—FT-241. 500 Kc. Reg. value 1.99
Total value $13.91

SPECIAL PACKAGE DEAL NO. 2 PRICE **$8.95** Postpaid!

SPECIAL PACKAGE DEAL NO. 3

FOR SINGLE SIDE BANDS!

36 FT-241 LOW FREQUENCY CRYSTALS

Frequency range from 370.370 Kc. to 435.185 Kc. in steps of every 1.852 Kc. approximately. Channels: 0 to 35.

Regular vlaue $14.04

SPECIAL PACKAGE DEAL NO. 3 PRICE **$3.95** Postpaid!

SPECIAL PACKAGE DEAL NUMBER 4

THE BIGGEST CRYSTAL BARGAIN EVER OFFERED! CONSISTS OF:

1 SPECIAL PACKAGE NO. 1. Regular value $9.95
1 SPECIAL PACKAGE NO. 2. Regular value 8.95
1 SPECIAL PACKAGE NO. 3. Regular value 3.95
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SPECIAL PRICE FOR ALL 3 PACKAGES ..... **$19.95** POSTPAID!

Sensational Package Offer of

3 RECEIVERS

COMPLETE WITH TUBES AND DYNAMOTORS!

75 MC. RECEIVER

Shipping Weight 16 lbs. Used, clean condition. Ea..... $4.95

RU-17 RECEIVER

T.R.F. Medium freq. Shipping wt. 14 lbs. Used, clean Ea $2.95

ARC-5 RECEIVER

3 to 6 MC. Less dial plate. Shipping wt. 12 lbs. Used, clean. Ea..... $4.95

Regular value $12.85

SPECIAL! ALL 3 RECEIVERS **$8.95**

Shipping weight total: 42 lbs., via railway express freight charges collect.

MISCELLANEOUS SPECIALS!

2 MFD. 6,000 V. CONDENSER. Used. Ea. $6.95
2 MFD. 5,000 V. CONDENSER. G.E Pyranol. Brand new Each $5.95

PLATE TRANSFORMER

American Trans. Co. INPUT: 115 VAC, 60 cycles. 525 KVA. PRI. 2240/1120 V. SEC. 500 MA. Brand new! Special. Shipping weight: 55 lbs **$14.95**

NEW CODE PRACTICE TAPE!

REELS NO. 5, 10, 11, 13, 14. Each ..... 99¢

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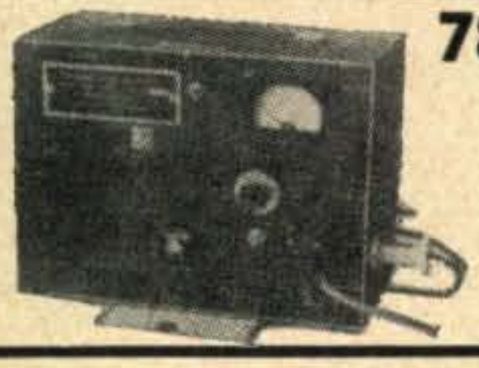

78-B MEASUREMENTS CORP. TEST SET SPECIAL!

Modulation 400 and 8200 cycles. 2 bands: 15-25 MC. and 190-230 MC. Operates on 117 VAC.—25 to 60 cycles.

New Condition. Shipping wt. 29 lbs. **$49.95**

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KV4, please QSL, etc., because I QSL 100 per cent for all cards received, but no others. 73."

Don Miller, W4VZQ/KC4AB, reports, "I thought I would tell you about my friend, Carl Shenk, WN4HBC. Carl received his call several weeks before he accompanied W4QCW and myself on the KC4AB DX-pedition to Navassa Island in the West Indies, last August. Carl, who was 17, withstood many hardships, such as seasickness and food poisoning on the DX-pedition, but he did much to make it a success.

"Although he was kept busy running the camp and exploring the island, Carl did find time to do a little hamming. He made his first contact as an amateur from KC4AB, the lucky fellow worked being WN4GMR, Miami Springs, Florida. Perhaps this has earned Carl the distinction of being one of the rarest Novices ever to operate. Other Novices who contacted us were WN5DMH and KN6ENL. 73."

Michael Glose, KN2JDB, 47 Sickmon Ave., Hamburg, N.Y., says, "I am writing to tell you how much your

Bob Dillon, KN6BHQ, Encino, Calif., looks prepared for almost any eventuality that may occur when he obtains his general class license.

technical topics in the *Novice Shack* have helped me and other Novices to understand theory better, to help us pass our General Class exams.

"The Novices of our town have started a Novice net. Jim, KN2HYQ; Doug, KN2JDS; Nancy, KN2JIR; and myself take turns being net control every Monday on 3738 Kc. at 2130, EST. 73."

Chuck Bunnell, WN8UAZ (13), 2125 Sheffield St., Middletown, Ohio, reports, "I have had my license for about two months. During this time I've worked 33 states, with 18 confirmed, all on 80 meters. I use a TR-75TV transmitter, an SW-54 receiver, and a 133-foot antenna. I operate a lot late at night on weekends and worked Puerto Rico at precisely 4:00 a.m. 73."

Bill, KN2IYO, 123 Sherron Ave., Salem, N.J., writes, "worked 18 states with my 3-watter, best DX was Georgia. Now have an AT-1 and have worked 25 states and VE1. Would like to make skeds with Alabama, Mississippi, and West Virginia. 73."

Bill also said that he was expanding the coverage of the club mentioned in the December, 1954, column to all "Generals" and Novices. He is also interested in the idea of a Novice QSL Bureau, as proposed by KN6ICS in the January column, and he would be willing to act as the KN2/WN2 manager.

Another ham interested in the Novice QSL Bureau idea is Richard Bristow, K6BBD, 1432 Heatherdale Ave., Santa Clara, Calif. He says, "My idea for a WN/KN QSL Bureau would be to run them like the ARRL QSL Bureaus for foreign cards. Each Novice would supply stamped envelopes addressed to himself, upon which his call letters are prominently posted, to obtain cards sent to him via the bureau. I'd like to hear from others interested in this idea, either by letter or on the 40-meter Novice Band. If there is enough interest in the idea, I would be glad to act as the KN/WN6 Manager, and a couple of

Help Wanted

Ricky Asher (13), 405 Moraine Road, **Highland Park, Ill.** (Will answer all letters received.)
John Snider (39), Box 487, **Great Falls, Montana.** (Tried to become a Ham four years ago. Wants to get started on the right foot this time.)
Eddie Neal (18), Box 248 **Sneed Hall, Texas** Technological College, Lubbock, Texas.
Russell Osborne (17), 1613 Daisy St., **Clearfield, Pa.** Phone: 5-5756 (after 5:00 p.m.).
Bill Jefferson (14), Greenwood Road, **Chapel Hill, N.C.**
Mike Mitchell, Box 28, **Simpsonville, Ky.** (Wants help and pen pals.)
Jerry Harvey (15), Box 602, **Goliad, Texas.** (Most interested in hearing from SWL's.)
Louis Gauthier, 3467 Hutchison St., **Montreal, P.Q., Canada.**
Steward H. MacKenzie, Jr., (20), 55 St. James St., **Roxbury 19, Mass.**
James Kronick (14), 16 Country Club Ave., **Adams, Mass.** Phone: 212-M.
James T. Smith (21), 3071 Wallace Road, **Huntington 5, W. Va.** Phone 26316.
Larry Munyon (9), 5810 Enright Ave., **Dayton, Ohio.** (His uncle, W6GTY, will set him up with a complete station, but thinks he is just a little far away to tutor Larry.)
Jimmy Briles, 207 West Market St., P.O. Box 415, **Graham, N.C.** Phone: 6-4735.
Roger Allan Holmen (14), 8319 SW Westgard Ave., **Portland 14, Oregon.** Phone: CH-4195.
Ralph Shaw, 205 N. Pine, **Hammond, La.** (Having trouble with code. Would like to hear from other SWL's.)
Ken Dixon (16), 635 Armour Road, **Peterborough, Ontario, Canada.** Phone: 6744.
Charles Ash (17), 1214 Dearborn, **Augusta, Kansas.**
Barclay Lee (13), E. Second Ave., **Dayton, Tenn.**
Douglas Brown, 1701 Primrose St., **Chevy Chase, Md.**
Verlyn Rogers (16), 156 MacArthur St., **So. St. Paul, Minn.**

Each Month *CQ* lists the names and addresses of prospective amateurs requesting help with code or theory. To have your name listed, address your request to Herb Brier, W9EGQ, 385 Johnson St., Gary 3, Indiana. Requests received by March 15 will appear in the May *Novice Shack*.

local Hams will be glad to help me. 73."

Bob Bair, WN7WKA, Route 1, Box 1089, Hood River, Oregon, writes under a letterhead that also lists Mary Bair, W7SYF, "Have been reading the *Novice Shack* about all the Novices wanting to work "7's". Here in W7 we have our troubles too. Right now, I am low power and can't raise anywhere near all I hear and call. I have heard all call areas and most states, but have only about 12 confirmed. About every other contact I have is with a "6," and believe it or not, I am the first W7 or Oregon contact for many of them.

"I think the main thing that Novices should do is to learn the code and correct operating practices and not worry so much about DX. I can copy 18 w.p.m. on tape, and three to 13 on the air, hi. 73."

Richard "Les" Wines, WN5FKW, 4230 Pine, Texarkana, Texas, writes, "I have been on the air for 6½ months and have worked 34 states. I run 60 watts to an 807 and use an S-38C receiver. My antenna is a 40-meter doublet. Got my license thanks to W5RZF, Dick, who struggled with me on the code. 73."

Read Stowe, WN4HOZ, 26 Highland Drive, Greenville,

[*Continued on page 60*]

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100% SATISFACTION
or Your Money Back at end of 10 day Trial

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NEW SX 96

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$25.00 Down
18 monthly payments of $13.60
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MODEL	CASH DOWN	20 MONTHLY PAYMENTS	CASH PRICE
S38D	$ 5.00	$ 2.45	$ 49.50
S94	6.00	2.97	59.95
S95	6.00	2.97	59.95
S85	12.00	5.94	119.95
S93	10.00	4.95	99.95
SX96	25.00	12.37	249.95
SX62A	35.00	17.32	349.95
SX88	67.50	33.41	675.00

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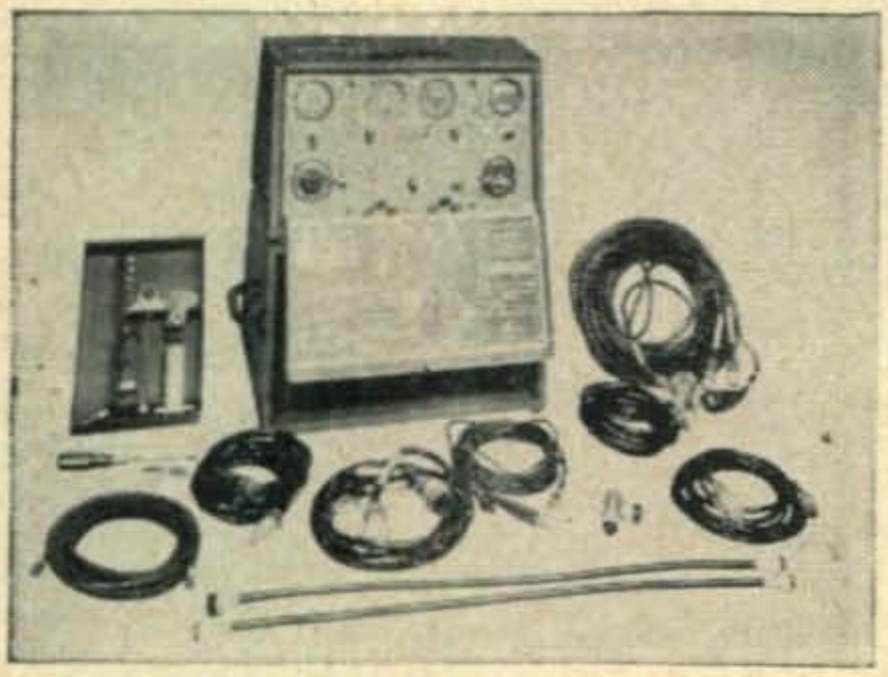
ESSE SUPER SPECIALS!



TEST SET EE-1A—Brand New—$39.50

Originally used to test turbo superchargers but may be cannabalized for parts such as combination AC & DC volt-ohm meter, variable speed drive as described on this page, manifold pressure gauge, .10-75 inches of mercury, amp. test gauge, adjustable pressure chamber, Fluorescent lights, aluminum case which folds together in center forming portable case size 2'H x 22" W x 12" D. with handles. (Makes ideal amplifier console). Olive drab crackle finish. Tool kit is also included containing slip joint pliers, screwdriver, torque wrench, tube puller, socket wrench set extension, & socket, spare fuses & bulbs, rt. angle drive, other accessories include 2—34" tack shafts, 15'⅛" hose with fittings, coil hi voltage cable/probe and clip, 75' 4 cond. #12 & 14 cable, misc. other cables and plugs. Entire unit brand new sealed in evacuated metal can shipped in wood box. Wgt. 270 lbs.

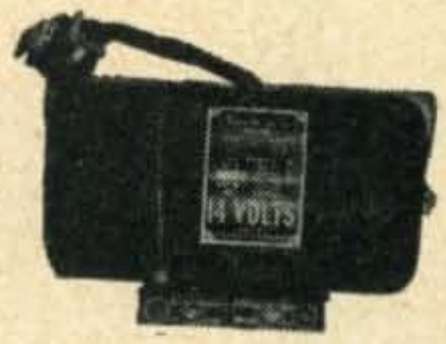
PRICE **$39.50** ea.

STORAGE BATTERY 6 V. 34 AH

3-TA5-9B—Manufactured by Exide Battery Co. for aircraft. Size 5" x 5" x 9" overall. Shipping weight 15 lbs. New dry charged. Fill with 1.265 sp.g. sulphuric acid. Price .....ea. **$4.95**

BRAND NEW 12 V. DYNAMOTORS

DM-40 Input: 12-14 V. 3.4 A. Output: 172 V. -138 MA. Here is an ideal dynamotor to adapt to mobile uses on the new 12 V. cars. Don't pass up this buy even if your intended uses are not immediate. Size 6¾" L x 3½" dia. 4" lead with 6 pin Jones plug. Shipping weight 7½ lbs.
New Price.....ea. **$2.75**

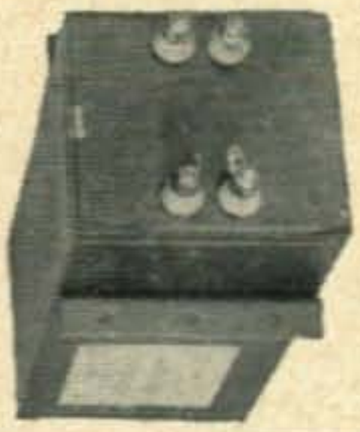


TRIP RELAY

Instantaneous class 9055 Type N. Manufactured by Square D Co. 23-47 amp. range; 600 V. Max. Shipping weight 3½ lbs.
Brand New .....ea. **$1.35**

DUAL 12 Henry CHOKE—New $1.95

Dual section 12 henry filter choke 100 ma. 150 ohms. Size 3-15/16" x 3-9/16" x 7¾" h. Mounting flanges 3" from top of porcelain insulated connecting posts. Wt. 15 lbs.
Brand new **$1.95**

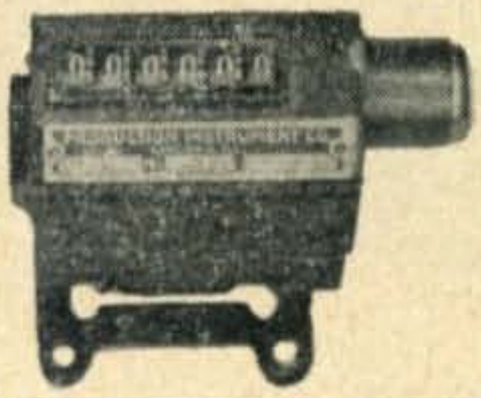


VARIABLE SPEED MOTOR — $11.50

1/10 H.P., 24 V. DC, 4200 Max. Rpm. Shunt type. Complete with speed control and Jaeger mechanical tachometer of 0-3300 Rpm. Has drive to fit the two 34" tack. shafts included. Wgt. 6 lbs.

Brand New — $11.50

PRODUCTION COUNTER — $3.75



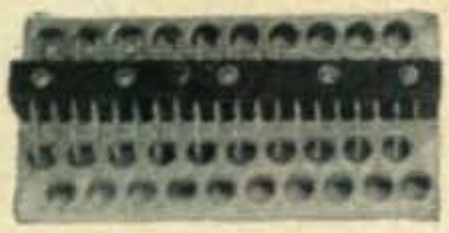
Production Instrument Co. Cat. No. EC-7K. For 115 V. DC. Counts up to 999999. Uses key reset (key not supplied. Used but guaranteed operating condition..... **$3.75**

RL-42-B ANTENNA REEL/Motor — $1.95

Used originally for remote controlling of automatic trailing wire antenna. Motor is ⅛ H.P. 24 V. D.C. with oil-less sleeve bearings. The gear train, breaking and disconnect mechanism, reversible and variable speed motor makes this an ideal unit for conversion to coil winders, etc. Ship wgt. approx. 5 lbs.

Good Used Condition — $1.95
Brand New — $2.75

Teleph. type Terminal Block



60 double tie point terminals on hardwood block size 6"x3"x2½" h. overall ....NEW ea. **75¢**

RELAY

12-18 Volt DC DPST type. Normally open contacts 200 ohm coil.
— NEW, price ea. **75¢**

J-47 Telegraph Key

Signal Corp type mounted on bakelite base 2¾"x5".
NEW ea. **99¢**

6 OR 12 VOLT POWER SUPPLY - - - $3.95

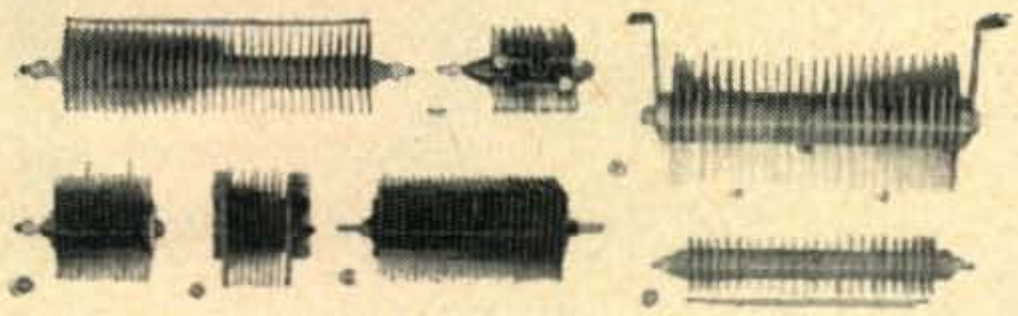
PE-117 vibrator power supply was designed for use on the Army BC-620 Transmitter and receiver a part of the SCR-509 and SCR-510. This will make an ideal supply for your mobile equipment on either the 6 or 12 volt cars. Voltage input changes are accomplished by merely changing links according to diagram in the cover (same vibrator used in either case). Supply is well filtered using choke input and plug-in type capacitors. Additional hash filtering is also incorporated for filaments of receiver. Output voltages are for transmitting 140 V. and 90 volts for receiving. The receiver output voltage is regulated by voltage regulator tube VT184. Maximum current drain is 100 Ma. Entire unit measures 12"x15"x4¾" in metal case or supply only may be removed for use which measures 11"x6"x4½". If you have no immediate use for this unit, it would be a good investment for possible future use. This is the type of surplus that doesn't last long at this price. Shipping wgt. approx. 32 lbs.

Brand new units - - - $4.95
Used good units - - - $3.95

20 WATT AMPLIFIER: Brand New

Mfd for audio amplifier in Measured Music Systems. Amplifier delivers 15 watts of undistorted audio or 20 watts maximum. Tubes used and included are 2—6L6G; 1—6SN7; 1—6SJ7; 1—5U4. Also 1—6AL5 and 1—2D21 used in remote control circuit. Treble, bass, vernier volume and master volume controls are provided. Sturdily built for continual operation in beautiful gray crackle cabinet 17" x 9¾" x 12½" with carrying handles and key lock cover. Unit is foolproof and trouble free, ideal for use in skating rinks, dance halls, etc. Has Phono and 600 ohm line inputs. Circuit diagram provided with each unit. Original Manufacturer's price on this item understood to be $129.50. Your price, brand new with all tubes, for 110-120 V. 60 cycle operation. Shipping weight 60 lbs..... **$19.95**

RECTIFIERS
Dry Discs Types — ALL NEW



A. B-2 Copper Sulphide 780-C1 Input 10-12 V. AC Full wave Output 6-8 V. DC @ 6 Amp..... **$3.95**

B. Mallory 1B20C7 Magnesium Sulphide. Input 12-14 V. AC Output Full Wave 6-8 V. DC @ 4.8 amp. **$3.95**

C. Kotron-Selenium—Input 16-18 full beam no load V. AC Full Wave Output 12-14 V. DC @ 3.5 amps. **$3.75**

D. Syntron SD-0077. Input 40-45 V. AC. Output 28-32 V. DC @ 4½ Amp. Half wave type. Use pair for full wave output ..... ea. **$3.95**

E. Mallory 1S48C7—Magnesium Copper Sulphide 36-40 V. AC Input. Output 28-32 V. DC cap. load. Full Wave at 8 amps.....ea. **$7.50**

F. GE—Copper Oxide. Input 110-125 V. AC. Output 93-110 V. DC @ 1 amp. **$4.95**

Detroit Expansion Valve
No. 674 — New — $2.75

Refrigeration expansion valve stock No. 674-205 with ¼" inlet, ½" SAE outlet, 5/32" orifice. For F-12 Refrigerant 45# Max. operating pressure. 60" length connecting tube.

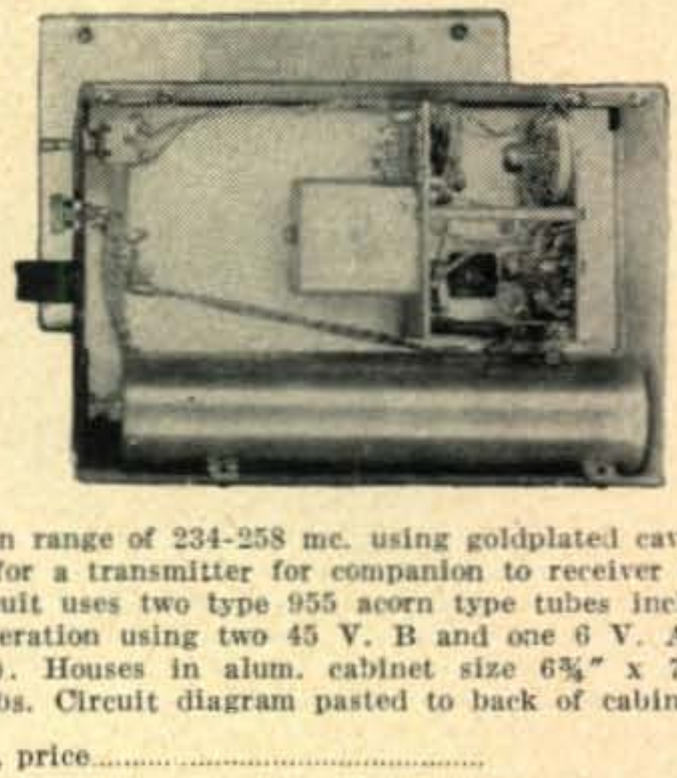
BRAND NEW ea. **$2.75**

R-1/ARR-1 RECEIVER — $3.95

Described in "Radio TV News" Jan. 1949 for use as 220 Mc. converter. Essentially a two stage RF acorn tube superhet converter as it now stands. Small enough for mobile only 3½"W x 3"H x 10"D. Rugged Aluminum construction. Uses four 954 acorn tubes included. Filaments now operate on 12 or 24 volts by merely throwing switch in unit or very easily modified for 6 V. operation. Dial is calibrated in range of 234-258 Mc. Operation can be changed for use from 50 to possibly 300 Mc. Also, the ARR-1 could be used for a preselector. Wgt. of unit 4 lbs. Cover not shown but included. Complete with conversion as written in above mag.

Price, Good Used — $3.95
Price, Brand New — $5.95

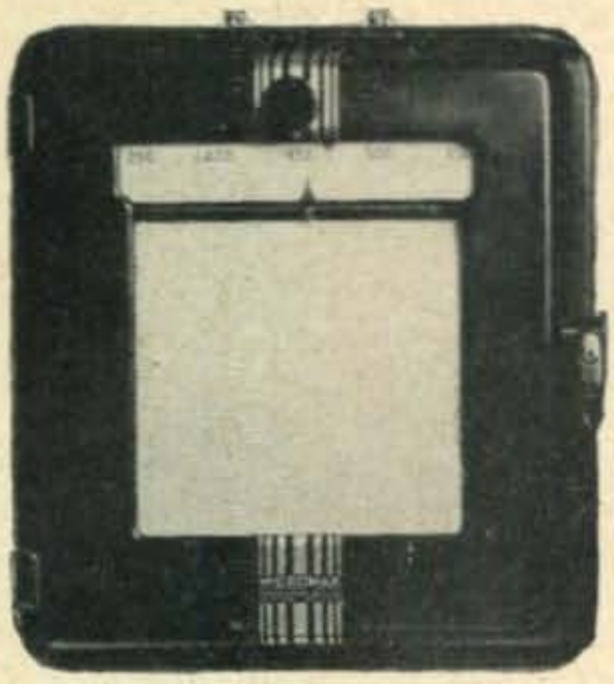
ARR-1 TEST OSCILLATOR — $4.95

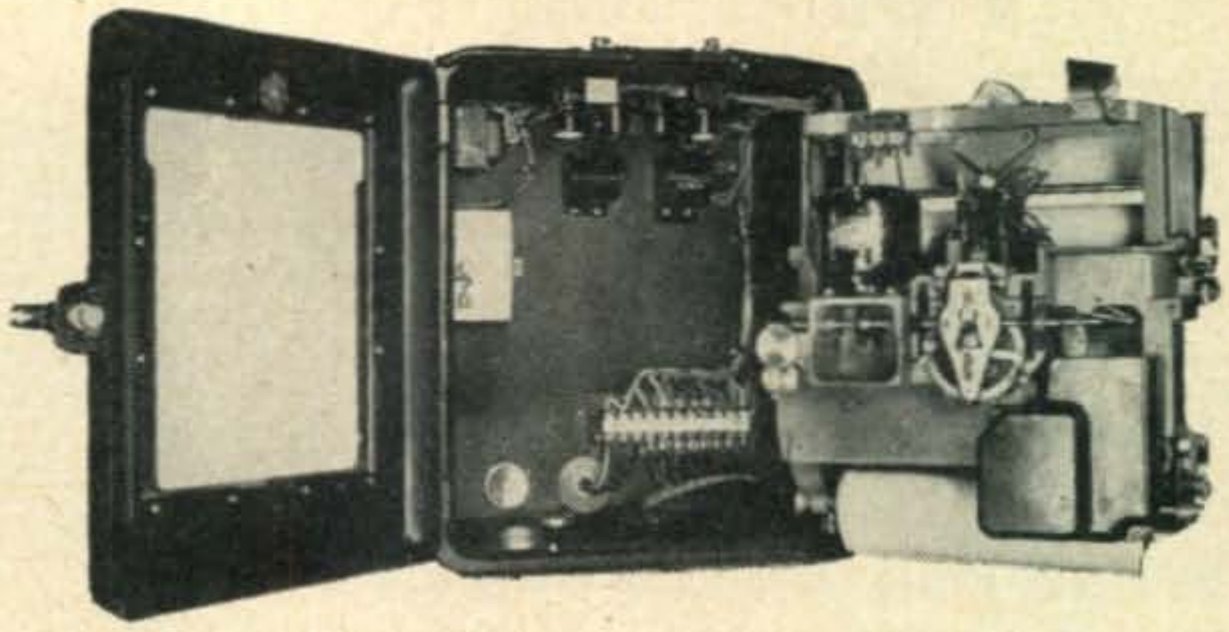


Operates in range of 234-258 mc. using goldplated cavity. Adapt this unit for a transmitter for companion to receiver listed this page. Circuit uses two type 955 acorn type tubes included. For battery operation using two 45 V. B and one 6 V. A batteries (not incl.). Houses in alum. cabinet size 6¾" x 7" x 9¾". Wt. 5½ lbs. Circuit diagram pasted to back of cabinet.

Good used, price..... **$4.95**

Brand New **$6.95**





LEEDS & NORTHRUP MICROMAX RECORDERS

These are the strip type recorders used for controlling and recording a wide variety of processes. Used originally for temp. range of 350-550 degrees C. but may be changed for other applications. Operates on Wheatstone bridge principle using AC galvanometer movement. Original cost was several times our price. These units were removed from demilitarized equipment which in many cases was new; however, all instruments sold as used but guaranteed, or money back if not satisfied.

PRICE — $89.50

GENERAL ELECTRIC HOUR METER — $5.00

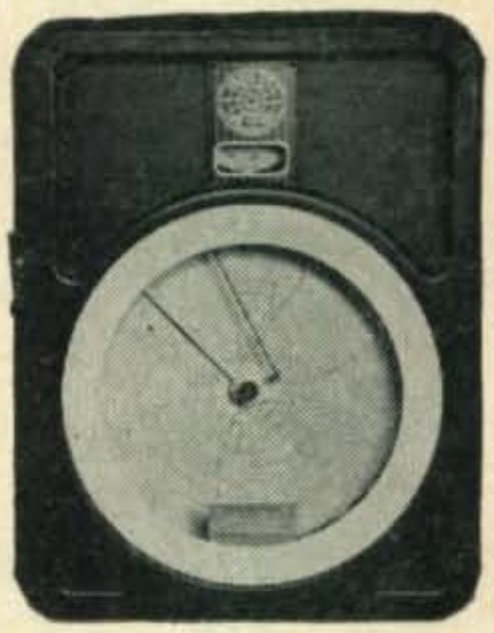
Model 8KT8 D2 for 115 V. 60 cycle. Registers up to 9999.9 hrs. Fits into standard 2-13/16" mounting hole. Square face. Units are new with zero hrs.; however, removed from demilitarized equipment.

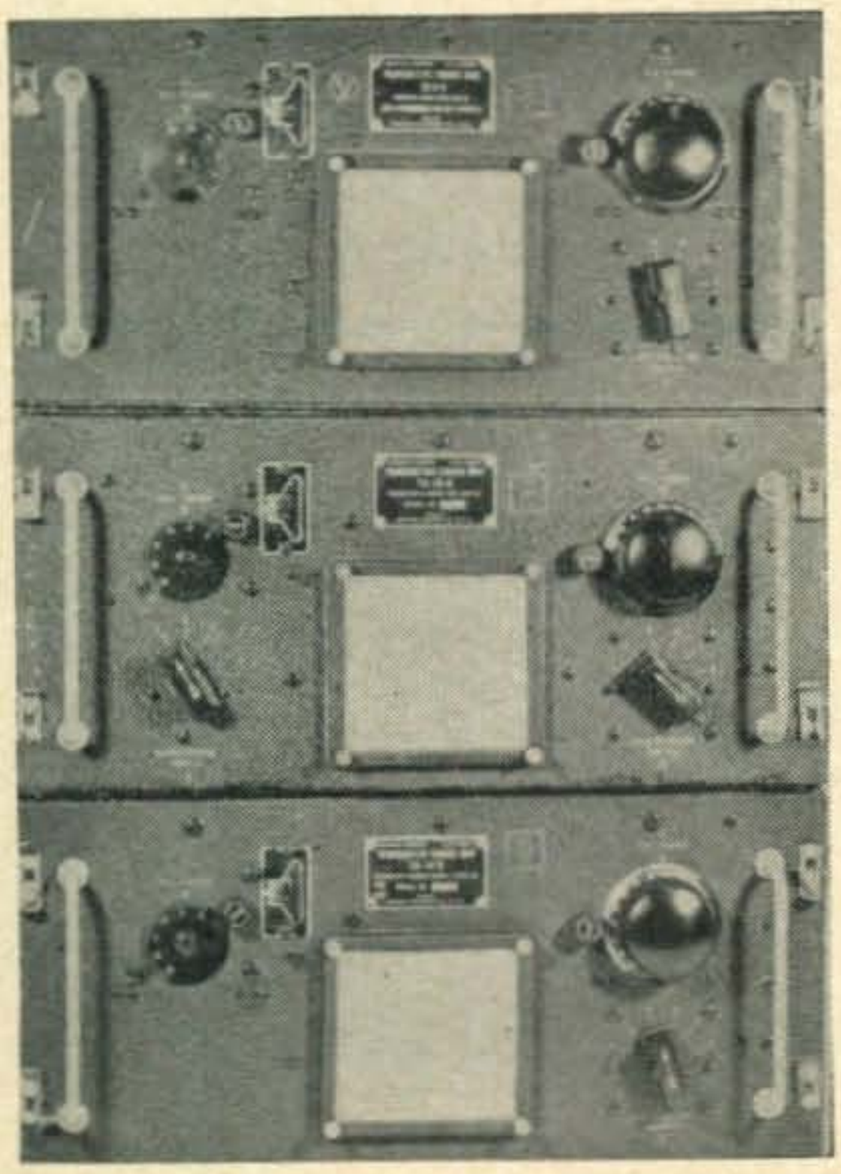
PRICE — $5.00 ea.

BAILEY METER RECORDERS

Used in applications as above at same temperature range, etc. Operates on electronic principles using vacuum tubes. Used but guaranteed condition.

PRICE — $49.50





TU-10-B TUNING UNITS — $1.95 ea.

Used in the BC-375 transmitter, but the most favorable and acceptable piece of surplus gear for obtaining good cheap useable parts. The TU-10-B contains three double spaced transmitting type variable condensers of 16, 27 and 7 plate varieties, 3 mica transmitting type micas, 2 isolantite shaft couplings, antenna coupling switch, two precision vernier dials, chokes, inductances and other useful parts. Better order plenty before supply is exhausted again. TU-7, TU-9, and TU-26 also in stock, same price. Ship. wt. 13 lbs., size 7⅝" x 16½" x 7½".

Used — $1.95 ea.

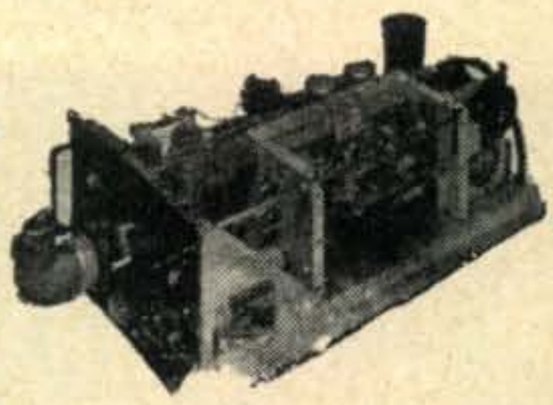
New — $2.50 ea.

CAP — 75 meter Mobile ATTENTION!
BC-454 RECEIVER — 3-6 Mc.

Here is an ideal receiver for CAP or mobile enthusiast. Excellent sensitivity and frequency stability are found in these receivers. Can be supplied converted for 6 V. filaments or with self-contained 110 V. AC power supply and Volume control ready for operation. Used but good.

110 V. Complete **$17.95**

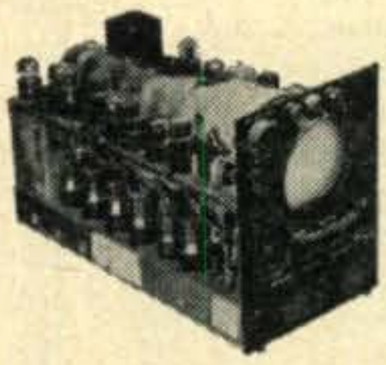
T-39/APQ-9 RADAR XMTR



Described in Feb. '50 "CQ" for conversion for the 420-450 Mc. amateur band and citizens band. Also contains many parts for the UHF experimenter such as 2—8012 tubes, fan and motor, switches, pots, gears, counter, etc. Equipment removed from aircraft. Our Close Out. quantity limited. **$4.95** ea.

Shipping wt. 43 lbs.

APN-4 RADAR SCOPE



Loran indicator scope. Ideal for conversion to service scope or other uses. Parts alone worth many times price. Contains 27 tubes such as 6SN7GT's, 6H6GT's, 6SL7GT's, 6SJ7GT's, and 5CP1CR, 100 Kc. crystal. In aluminum case approx. 9"x12"x18". Wgt. approx. 45 lbs. packed. Removed from surplus aircraft. PRICE **$29.75**

BC - 433 - G
RADIO COMPASS

Three band coverage of 200-1750 Kc. Ideal for use as home or mobile receiver for long wave broadcast listening or may be used with components listed below for automatic direction finding. All 17 tubes included. Removed from surplus aircraft. Wt. 43 lbs. Price **$14.95**

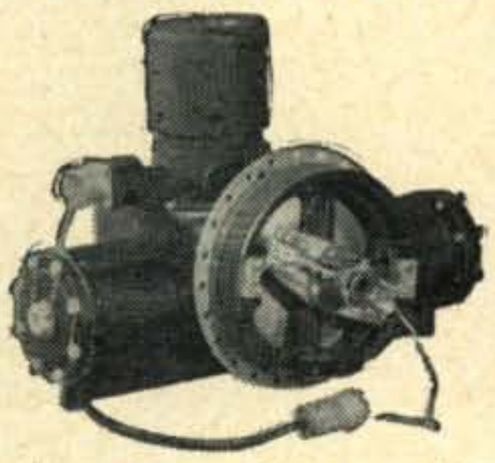
SCR-269 ACCESSORIES

LP-21A or F loop antenna	$15.00 used
CD-365A cord assembly	4.50 new
I-81A Indicator	7.50 new

AN/ART-4 TRANSMITTERS with Target

These small battery operated transmitters were used to transmit a signal back to another plane when the 6 ft. by 30 ft. target was hit. Transmitters operated on 55.5 mc. and 56.75 mc. using 3A5 tubes. They have found favorable acceptance for conversion and use with model radio controlled planes and boats. The target is made of plastic screen which may be used for homes, patios, etc. as it will not rust or rot and outlasts any wire screen. Units are brand new and come in wood box 10" x 12" x 75". Ship. wt. 75 lbs. Our fortunate purchase of a great quantity of these allows for the low price so don't be misled. Many who ordered before have repeated for several more units. Our price while remaining stock lasts. **$3.95 ea.**

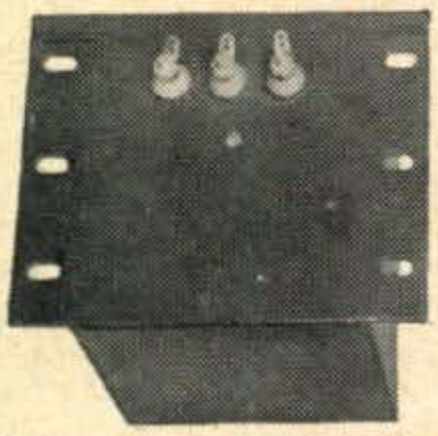
M-1 SERVO UNIT FOR BEAM ROTATION



Unit has self-contained hydraulic pump actuated by 27 V.—11 Amp. 1/5 hp. motor which pumps oil into either side of hydraulic piston giving better than a 100 lb. torque to cable drum. Unit is reversible by actuation of either of two self-contained solenoid hydraulic valves. Connect by cable around antenna beam for any desired rotation speed. Greater adaptability than any other surplus device on the market. Shg. wgt. 37 lbs. **$4.95**

BRAND NEW—Only a few, order early

TRANSTAT — New — $3.95



Transtat autoformer 117 V. input 2.5 A. 423 V .8 amp. output. Size 6½" x 5¼" x 5" h. Wt. 15 lbs. Gvnmt. cost $28.00 ea.

OUR PRICE, NEW **$3.95**

Kenyon Audio Repeat Transformer — $.79

1:1 Ratio audio transformer mfgd. by Kenyon housed in metal case with electrostatic shield. Size 3-1/16" x 2-9/16" x 4-1/16" h. Wt. 2½ lbs.

BRAND NEW.....ea. **79¢**

CAP & MOBILE HAMS ATTENTION!!
Transmitter — $3.95

Aircraft Transmitter—Either BC-430 or BC-230, similar except for supply voltage of either 12 or 24 V. (no choice as units are already packed by Signal Corps and no correct designation). These units are companion transmitter to receiver at right. Contains two type 10 and two type 45 tubes, 0-1.5 amp R.F. Ammeter and power output approx. 25 watts. Frequency range 195—13,975 Kc. Supplied with coil set 2500—3105 Kc. Other ranges supplied at 75¢ ea. coil while available. Size 6"H. x 6⅜"W x 11"D. Wgt. approx. 13 lbs. Sold as used however, many cannot be told from new. Shock mount base included in many but not all cases.

PRICE — $3.95 ea.

REMIT SHIPPING CHARGE AND INSTRUCTIONS WITH ALL ORDERS, OTHERWISE ORDER WILL BE SHIPPED EXPRESS COLLECT. ALL ITEMS GUARANTEED TO YOUR SATISFACTION OR MONEY REFUNDED IF RETURNED PREPAID WITHIN 10 DAYS OF RECEIPT.

ESSE RADIO CO.

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$194.50

NEW DELUXE "PHASEMASTER"-JR

CHECK THESE EXCLUSIVE FEATURES

- ✓ SSB with Switchable Sidebands also AM-PM and CW operation
- ✓ 50W Average Voice Power Input
- ✓ Heterodyning Phasing Type Exciter
- ✓ All band 160M thru 10M supplied with heterodyning crystal and coils for 80M operation
- ✓ 40DB or more SB suppression
- ✓ New Carrier Level Control - inserts carrier for AM operation - zero beating VFO – or tuning, without disturbing carrier suppression
- ✓ Superb Anti-Trip Voice Control operation with ATVC plug-in unit
- ✓ RCVR muting and final amplifier blocking bias
- ✓ New Eye Indicator — for carrier balancing — tuning — AM modulation
- ✓ Simplified operating controls

OTHER FAMOUS SSB EQUIP.

Phasemaster-Jr. Exciter
Kit **$74.50** wired & tested **$92.50**
P-500 Linear Final **$197.50**
ATVC Voice Control plug-in Unit **$23.50**
New Electronic Tenna Switch **$23.50**

Write for complete catalog

Lakeshore INDUSTRIES

408 COMMERCIAL STREET MANITOWOC, WISCONSIN
MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

Q-Multiplier

[*from page 30*]

the resonant frequency of the combination is that of the i-f stage.

Q: Is shielding required when the *Q Multiplier* is built directly into a receiver?

A: Complete shielding is best for optimum performance.

Q: Even when the r-c filter *R9-C8* is used, excessive hum is heard when the unit is switched into the circuit. What is wrong?

A: This may be due to the proximity of *L1* or *L2* to a magnetic field such as that set up by a power transformer. Either relocate these coils, or use a magnetic shield (ferrous material) well spaced from the coils. The ferrite cores are very susceptible to stray magnetic fields.

Q: When the selectivity control *R7* is set near maximum selectivity, the circuit breaks into oscillation when *C3* is rotated to one side of the center frequency, but when it is rotated in the other direction, this oscillation does not occur. What is wrong?

A: There is an optimum ratio between *C4* and *C5* which should prevent this occurrence. Variable padders may be connected across these capacitors, so that the exact ratio may be had, but, in practice, it usually will be found that absolute perfect balance either side of the center point is very difficult to realize when *R7* is set for maximum selectivity or at the threshold of oscillation. The specified values of .001 μfd for *C4*, and 2700 $\mu\mu$fd for *C5*, together with the other specified components, will have only a very slight tendency toward unbalance over the 450- to 500-kc range. In other cases it may be necessary to rebalance with variable padders.

[*to be continued*]

Coming up

One of the feature articles next month will be an inexpensive and easily available mechanism for putting Morse code in punched tape and then sending it at any speed up to 100 wpm. This should be of tremendous interest to any CW operator who has wanted to use automatic equipment for message handling, CQ'ing, station descriptions, etc.

The May issue of CQ will again be a Special Mobile issue. Some of the articles are so "hot" that it seems a shame to wait the extra month to print them, but the issue must be a fat one, so you'll have to wait. Sorry.

The February Zero Bias column mentioned the plight of handicapped hams. Since then mail has been strong on this subject. Do you want a regular column for communication of ideas and solutions to the problems of our handicapped amateurs?

Really Regulated

(from page 25)

Construction

As with most power supplies, construction is not at all critical, since no tuned circuits are involved. However, it is wise to locate the control tube as far as practicable from the external magnetic fields of the transformers and chokes, and to dress its leads well away from other leads carrying a.c. or pulsating d.c. Use of a television type power transformer with a copper belly band for suppression of external field was made in the present unit, but it is not absolutely necessary. If the layout and parts list given are followed, there should be no difficulty in getting correct operation as soon as the unit has been fired up and adjusted. The physical layout and placement of parts is clear from the photographs, and can be varied within reasonable limits without change in performance.

Adjustment and Operation

When the wiring has been completed and double-checked, set *R5* and *R11* at about the middle of their ranges, and connect a load that will draw about 200 ma. at 150 volts. Turn on the supply, set *R11* to give 150 volts output, and adjust *R14* so that *I1* and *I2* glow with equal brilliance. This balances the cathode currents of *V6* and *V7* at the maximum drain condition, which is the place where balance is most desirable. Next change the load so that a much smaller load current is drawn, and note the change in output voltage produced. The change will be very small, and may be difficult to measure unless a bucking voltage and sensitive meter can be used.

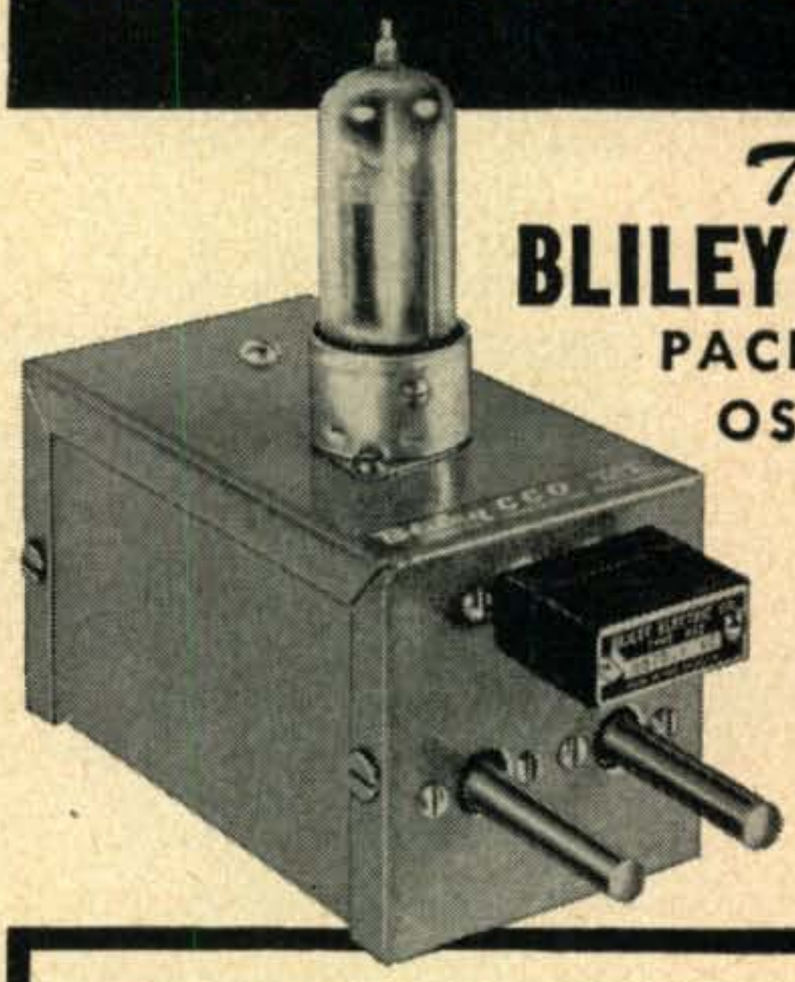
When the best possible regulation is required, as when using the supply for precise measurement, or as a klystron repellor voltage source, a more careful adjustment of *R5*, the bias correcting control, is required. Changes in load current cause small changes in the voltage drop across *R5*, which appear in the grid-to-cathode bias of *V4* with such polarity as to further reduce the change of output voltage. By changing the load current a definite amount, and adjusting *R5* each time, a setting of *R5* will be found which results in minimum change of output voltage

(Continued on page 53)

"Hot" Receivers

Bob Henry offers a reward for return or information leading to the conviction of those responsible for the midnight loss of two Collins 75A3 receivers, (#1573 and 1585), a 32V3 Collins transmitter (#1489), an Elmac PMA-6A 12 volt receiver (#3096) and an Elmac power supply PSR-12 (#554).

NEW... FOR TWO AND SIX METER OPERATION



The BLILEY CCO-2L PACKAGED OSCILLATOR

Now available for your amateur rig, a completely packaged oscillator unit designed and engineered to utilize the many advantages of crystal control on two and six meters. Output is obtained directly on six meters; operation on two meters requires only a tripler stage.

The CCO-2L is the ideal oscillator for an efficient two band transmitter, or as a basic unit in new construction. Features include: adequate drive for V. H. F. medium power beam tubes, no self-oscillation under any operating conditions.

The CCO-2L is semi-enclosed in a metal case with power input and r.f. output terminals in the back for short direct external connections. The oscillator tube specified is a 12BH7.

CCO-2L Output: 48 to 54 mc; Dimensions: 2¼" x 2¼" x 4"; Price: $11.95 less tube and crystal (8-9 mc).

The following Bliley AX2 crystals recommended for use with the CCO-2L:

AX2 crystal for six meters, 8333-9000 kc	$2.95
AX2 crystal for two meters, 8000-8222 kc	$2.95

See your amateur distributor for these high quality amateur products.

Bliley CRYSTALS

BLILEY ELECTRIC COMPANY
UNION STATION BUILDING
ERIE, PENNSYLVANIA

got enough EARS?

BE ON THE CONSTANT ALERT

All Departments Can Now Listen to Every Vital Message

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- Prices to meet any budget.
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MONITORADIO RADIO APPARATUS CORPORATION

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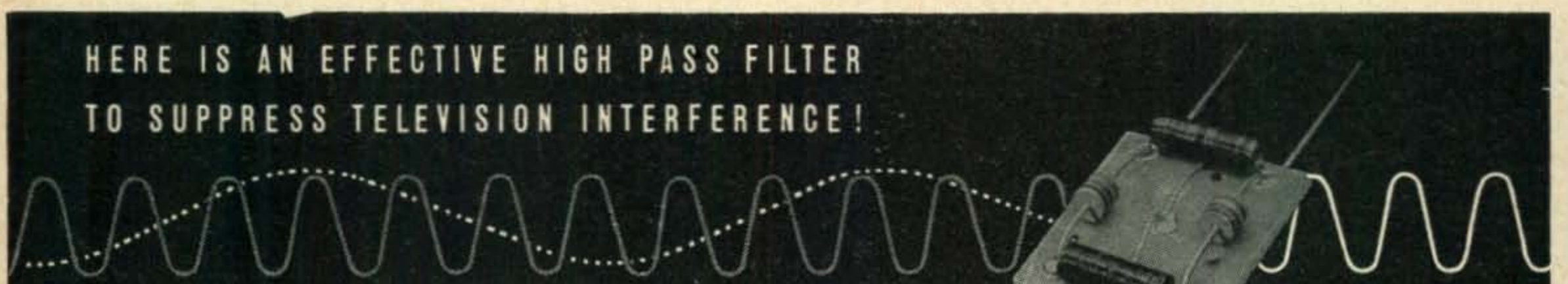

The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line.
Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db. or more.
Signals above 55mc. are passed through the filter without loss.
Simple to install--full instructions included with each unit.

Regency

MODEL HP-45

REGENCY Division of I.D.E.A., Inc., Indianapolis 26, Ind.

AMATEUR NET, ONLY 99c

(*from page 51*)

for a given change of load current. This action is so good at the optimum adjustment that it becomes difficult to detect the change in output voltage by ordinary means.

Performance Data

The measured performance of the supply is illustrated by the curves of *Fig. 2*, and the data of *Table 1*. If the specified parts are used, there will be little change of performance over months of service life, as ample factors of safety have been specified. Balance adjustment is usually only necessary when a tube is changed in the regulation stage. If the unregulated output voltage is used simultaneously with the regulated voltage, some upset of the regulation must be expected, since the current from the unregulated tap will also pass through *R5*. With this circuit, operation on either the regulated or unregulated output is feasible, and if the drain from the unregulated tap is steady, both outputs may be used with little serious effect on the regulated voltage. However, if the drain on the unregulated tap varies, it is better to revamp the circuit to make use of the more conventional arrangement, with the reference voltage tube directly in series with the control tube cathode. This does not provide the bias correcting feature of the present circuit, but is more desirable for the operating condition just described.

21-Mc Converter

(*from page 28*)

tween *L4* and *L3* until the meter shows a sharp rise as the signal is tuned into the 21-Mc band edge, with a mild drop in the center of the band. This slight over coupling helps to give relatively uniform response out to the band edges.

As adjusted at W8LHK, the converter gives the overall response shown in *Fig. 4*. Excessive coupling between *L3* and *L4* will result in a response like *Fig. 5*, while too little coupling will drop the response at the band edges.

In the four months or so of use at W8LHK up to the time of writing, the stability, sensitivity, and signal-plus-noise to noise ratio have been exceptional. Disconnecting the antenna causes a 4 to 6 db. drop in noise output, indicating that the limiting factor is not in the converter. Several solid QSO's with weak VK3 and KH6 stations were had during brief band openings, with the blessed advantage of the slow-tuning 80-meter receiver bandspread. Only one fly remains in the ointment; a harmonic of the receiver local oscillator falls in the 21-Mc band in the W8LHK set-up. If you can't quell yours, learn to recognize it, at least.

Springtime is Baseball Time

Baseball Time is TV Time

TV Time is Trouble Time for the Ham whose neighbors have

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LF-601 Low Pass Filter

Interference to TV reception caused by transmissions from a Ham station can be caused by harmonics from the transmitter. They can be greatly reduced or eliminated with a Bud LF-601 low pass filter. Minimum attenuation of 85 decibels on all frequencies above 54 megacycles and a minimum of 93 decibels above 70 megacycles. Can be used with 52 or 72 ohm coax. Cut-off frequency is 42 megacycles. Maximum rejection adjustable from 55 to 90 megacycles.

LF-601 Amateur Net $13.95

HF-600 High Pass Filter

Has cut-off frequency at 42 megacycles, thus this filter rejects signals from 0 to 42 megacycles. It is within this range that the majority of signals causing interference are received. Since there is no attenuation above 42 megacycles, picture strength or quality is not affected. This unit is easily attached to the TV set.

HF-600 Amateur Net $3.00

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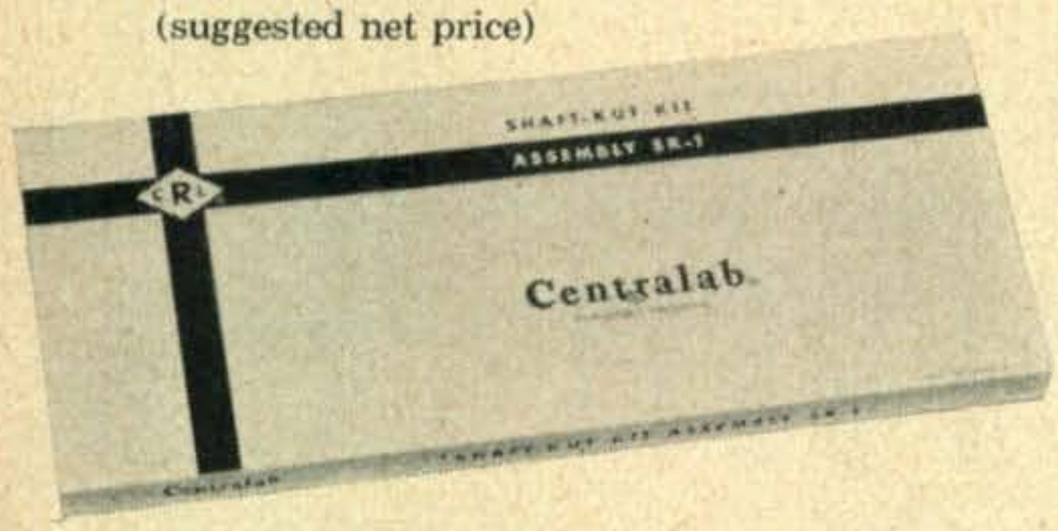
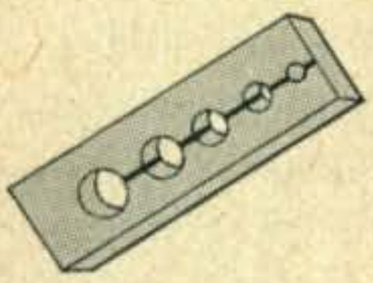


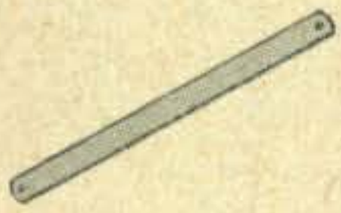
New Tool Kit simplifies cutting of control and switch shafts

Centralab Shaft-Kut Kit

These tools are especially handy when you have to cut off a shaft, adapt a shaft and knob type, or pry out the slot in a Centralab "R"-type Front Fastatch Dual Control. Here's what you get:

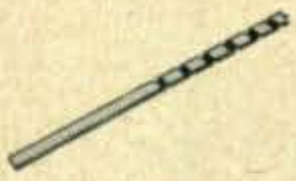


1. Custom-made, hardened carbon-steel, shaft clamp that holds any shaft in a vise, firmly and without damage.



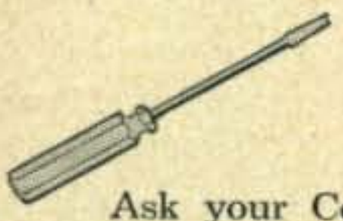
2. Fine-tooth, high-speed hack saw blade that has extra-fine teeth (32 per inch) for a clean cut.

3. Precision, half-round, needle file that is narrow enough to get inside the tubular outer shaft of a dual concentric.



4. "A"-size drill that is just the right size to drill out those few special plastic knobs so that they fit the inner shaft of a CRL Fastatch dual.

5. AK-16 drill stop that limits the depth of cut to the exact dimension required.



6. Small screwdriver that you can use to adjust set-screw knobs, and to do many other jobs.

Ask your Centralab distributor to show you a Centralab Shaft-Kut Kit. See if you don't agree that it can be mighty useful to you in a hundred-and-one different ways. Then buy one.

Centralab®

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B-755

RUGGED RANKS

[*from page 21*]

did the dumbest things. You could give a 100-pound anvil to him, and he find a way of "modifying" it. All that kept him from doing a job on the tubes in his transmitter was the lack of a diffusion pump. There just was nothing built that he did not think needed some improvement to make it hotter, stabler, or easier to operate. His receiver was the same model as the one I used at that time——at least they both had the same panel and nameplate, but after Diddler got through tailoring his, no one knew what he had. He changed everything in it except the fuse, and that blew the first time he turned it on. Maybe some of his changes were good, but generally they were regrettable. But he believed in them. He even wrote a letter once to WWV and told them they were off frequency. O'Day went beyond the realm of radio with this——he tried to soup up his old man's Reo Flying Cloud and almost got into a lawsuit. Well, Diddler worked for an accounting firm, and he was a good man there. He had to be. If he had modified their books per instinct he would have ended up worse off than Jack the Spider.

"When I think of Diddler O'Day, it automatically brings to mind my old friend, Joe Jerkman, the Jenuine Jenius, who was what O'Day fancied himself to be. Joe was a designer in a plant where they made automatic packaging machinery and was a truly clever guy. He had more tricky and unusual ways of doing things than I've seen in a long time. For instance, he rigged up a thermally operated automatic final resonator, and he contrived an automatic T-R antenna deal way back when. The Jenuine Jenius was the first Ham I knew to beat a 455-kc crystal against the oscillator in his receiver to effect an automatic-following v-f-o arrangement. Yes, that was long ago. Just about every time I went to see Joe, he had something new worked up in the gadget line. He never got to spend as much time on the air as he would have liked to, because he also worked up some slick toys for the kids, and they were always after him for more."

"That's the trouble with all this," I replied, "I never get enough time to do everything I want to. I fish for a little DX and a few trout, and that's it."

The Old Timer sighed and said, "Well most of us can't find time for everything, but some fellows will still try, anyway. One member of the old Key Klix Klan was a true dilettante. Why shouldn't Dilly have been in the Klan? He was in every club, lodge, association, and league in the county. He went in for anything that caught his fancy, and few things didn't. He rode horseback, lectured at the camera club, flew a plane, shot at skeets, sang in a glee

club, marched with the marching society, played the triangle in the town symphony, read Walpole, arched, swam, drank, mounted butterflies, studied semantics by correspondence, and tried to grind a mirror for a telescope. And the funny thing is that he could actually do a lot of these things. He was one of those gents who learn things fast and never seem to lose the knack. I guess he got his Ham license with about as much trouble as it takes me to get a bus ticket to Riverside. Well, Dilly didn't make WAZ or handle traffic for an Antarctic expedition. The last I heard of him, he had bought a chanter——that's a little sort of end-fire piccolo, and I understand after you master the thing, you are ready for bagpipe playing."

"WAZ reminds me that there's a contest coming up. Are you going to get into it this year?" I asked.

"Guess so. I'll have to get in there and make the going rough for some of the youngsters. It'll be rough all right . . . only on me! They'll kill me off in the first hour, as usual. I'm sure of one thing——Big Bill Brown, the Confirmed Contestant, will be in there. He is some specimen. For a year his rig stands dead, then whammy——contest time. He warms up his receiver and VFO for a week or ten days in advance, goes over his antennas, buys a dozen pencils, inflates his seat cushion, procures a few cases of Old Gassmeyer, "The Beer That, etc.", and then crouches ready to spring. He takes the start-off right from WWV and fights right through to the last echo of the thing. When it's all over he shuts his shack for another year. Doesn't even empty the ash trays. Big Bill sure did things for the club score of the Key Klix Klan."

I wanted to make sure that my friend did not consider me as one of his "youngsters" who offered such persistent competition in contests.

"Well, I wouldn't say," he replied with a sly grin, "but I'll tell you one thing. They are picking up some mighty young recruits for our rugged ranks of radio these days, or else there's a lot of midgets around. I saw Daniel McBoone the other day with a pack of little characters in tow all of which could walk right under this table without bending any, so help me. Some of them must be learning the code now, and some of them will become Hams. You don't know Dan? He's one of the local Hams. Also a Boy Scout man. Spends a lot of time——practically all of his spare time——working with the kids. He is a good fellow, and we could use a lot more like him. Whenever he gets down to a club meeting, he manages to fetch some of the boys along with him. Knows they're interested and will get a kick out of same. McBoone's real interest in amateur radio lies in its relationship to Scout work and the youngsters. He has just an old blooper for a receiver and his rig is a small CW job, but it looks like NBC to those kids. I don't see where

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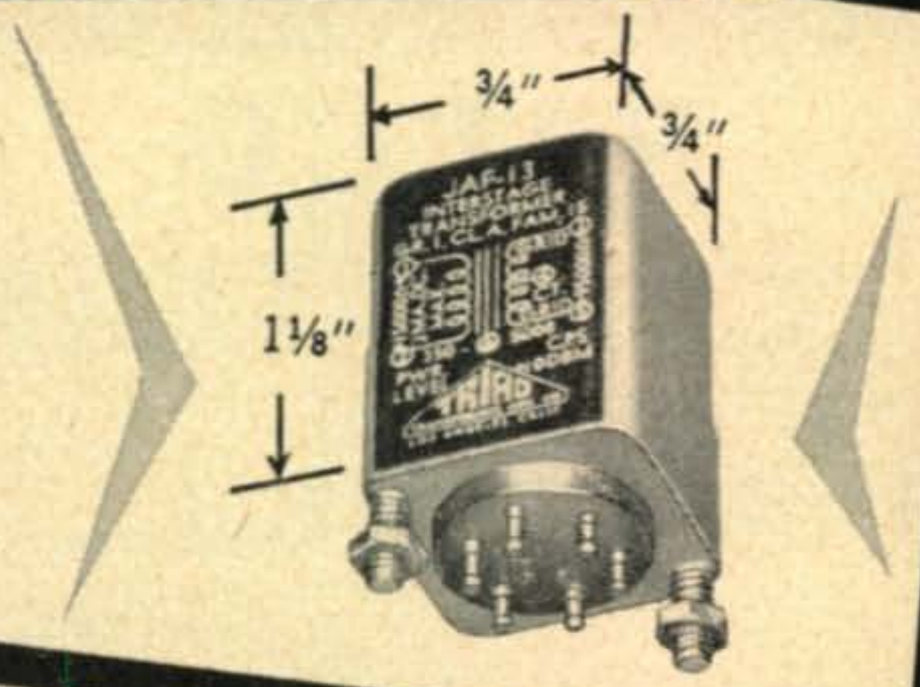

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Type No.	List Price	Application	Impedance Primary	Impedance Secondary
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JAF-11	15.50	Plate to grid.	15000	50000
JAF-12	16.00	Plate to p.p. grids.	15000	60000 C.T.
JAF-13	16.50	Plate to p.p. grids. DC in pri.	15000	95000 C.T.
JAF-14	16.50	Mike or line to grid.	200	½ megohm
JAF-15	16.50	Single plate to single grid.	15000	1 megohm
JAF-21	16.00	Plate to line.	15000	600/250/50
JAF-22	16.00	Plate to line. DC in pri.	15000	600/250/50
JAF-23	16.50	P.p. plates to line.	20000 C.T.	600/250/50
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Shielding: 45 db. on all items.
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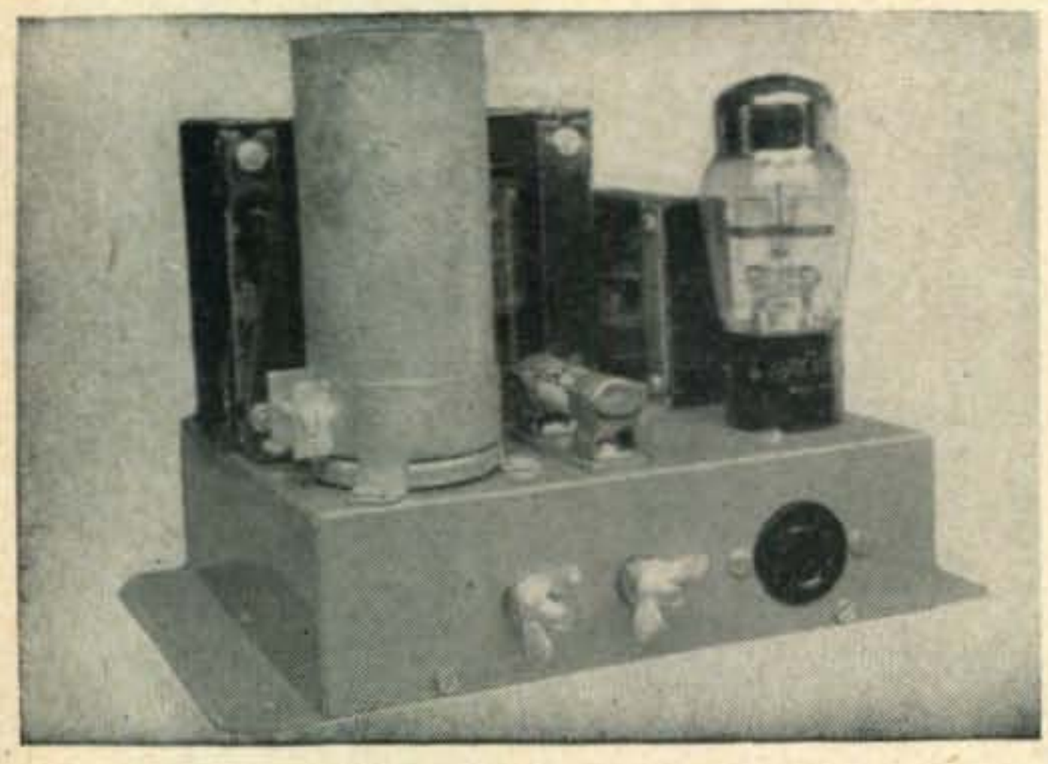

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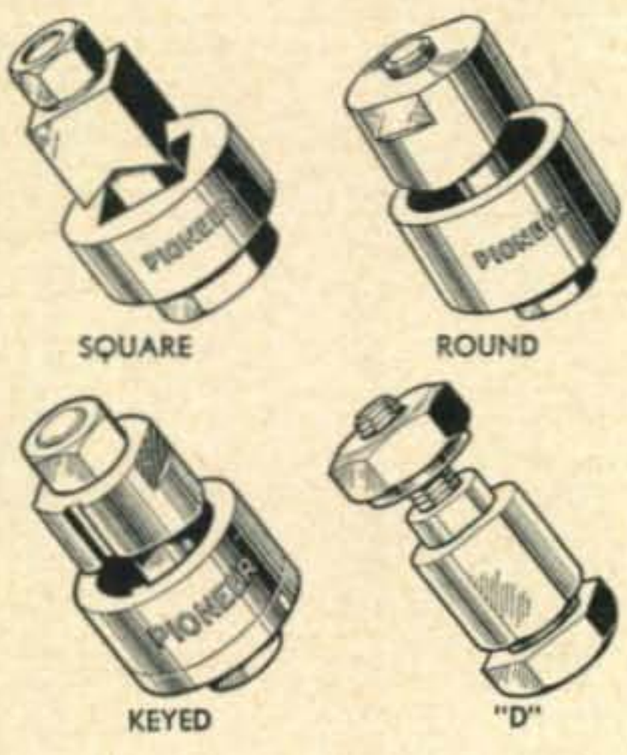

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5/8"	$3.30
11/16"	3.70
¾"	3.85
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• **KEYED**

1-11/64"	$3.75
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½"	$2.15	1"	2.30	1-3/16"	2.45
5/8"	2.15	1-1/16"	2.45	1¼"	2.45
11/16"	2.15	1⅛"	2.45	1⅜"	2.80
¾"	2.15	1-5/32"	2.45	1½"	3.15
⅞"	2.15	1-11/64"	2.45	2¼"	6.15

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[*from preceding page*]

Dan'l gets the patience to sit down and pound out two words a minute all evening to the little rascals, but he does it. They tell me that he can teach them stuff in such a way as to make them think they are sort of discovering things for the first time. They all think McBoone is strictly 599x. If kids and dogs like you, the good Lord will too."

By this time the Old Gassmeyer was gone, and so was today. As I prepared to depart, I said, "Well, I guess us Hams are a pretty good bunch of guys, eh?"

"Unfortunately," replied my host, "there must be exceptions. Why there must be exceptions, I do not know, but evidently there must be. I'm naming no names, but there is a chap we can call the 'Tramp'. There is just about one in every club, and the good old Key Klix Klan was no exception. The Tramp is a hopeless fanatic. I suppose all fanatics are hopeless, but the Tramp is worse. All he does, or wants to do, or thinks about, or does anything about, is Ham radio. He is a nuisance to neighbors, a liability to his boss, a discredit to his forebears, and a misfortune for his family. His kids go raggedy, but somehow he manages to buy the latest receiver——strictly premium merchandise. He can remember the call letters of the only station in Azerbaijan, but he never remembers his wife's birthday. Most of us have a hard time remembering it, but we know she has at least *one* each year, anyway, and that's what counts. The Tramp will destroy a beautiful tree to make way for an antenna which will do little for his lousy signal. Let him in a round table, and he takes over. Let him in your club, and he'll raise a debate over something obviously unanimous. I guess the one thing you can say for the Tramp is that he reduces QRM. When the fellows hear him on, or think he might come on, they stay off to avoid him. We hear people refer to us at times as being in need of psychiatric treatment——or something equally unflattering. Those folks have met The Tramp, or The Tramp's neighbor or employer. All of us have a little of The Tramp in us at one time or another. Sometimes a firm word from the XYL is all that's needed to remind us that it is important to have our feet on the ground as well as having that antenna in the air. Sometimes an encounter with The Tramp does the trick.

"You might say that all of us have a little of each of these fellows I've mentioned in us in varying degrees. You may not agree with that, but I'm sure of one thing——all Hams are not alike by any means, and that makes it all the more fun. Well, good night, thanks for calling, and drop in any time you are over this way."

"Good night, and thanks for the refreshments," I called out as I left.

It had been a real nice QSO, and there was no QRM.

COMING!

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65 W - Phone
90 W - CW

Watch for our ad in the next issue for more details of this remarkable new transmitter. Now you can have the power and quality you want in the smallest, most compact "package" yet!

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NOW you too can have sparkling single sideband performance from this fine transmitter. Add the B&W 51SB Single Sideband Generator to your Viking II, and you'll enjoy all the operating characteristics you now get *plus* the superior effectiveness of SSB transmission. Here are just a few of the features of the B&W 51SB:

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The 51SB comes to you ready for hook-up to your Viking. Complete instructions and necessary modification kit are of course included.

Construction of the 51SB is completely unitized. The equipment can easily be removed in three major subassemblies: R-F Unit, Audio Unit, and Main Chassis Unit. It's entirely self-contained except for microphone.

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Factory wired and tested. Complete with tubes, instructions, modification kit.

Watch for News

Information on application of 51SB to other communication transmitters will follow soon!

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S202T—Std. 20m 2-El. T match, $24.95. 1—12' Boom. 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, ⅞" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

D103T—DeLuxe 10m 3-El. T match, $25.95. 1—8' Boom. 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, ⅞" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

D203T—DeLuxe 20m 3-El, T match, $49.95. 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, ⅞" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

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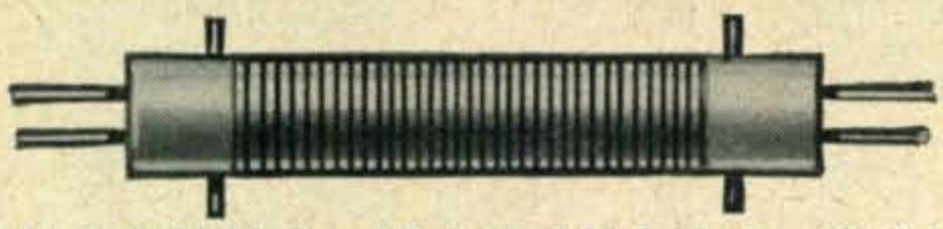

ANTENNA MATCHING COIL

Have you wondered where you could secure the Balun coils referred to in the December, 1953 issue of QST and in the ARRL handbook? If so, you probably have a need for a matching transformer to couple the 300 ohm line from your antenna to the 75 ohm input on your converter. Or does your present setup involve lengths of Co-ax to satisfy this requirement? Or even worse, are you just guessing and, as a result, losing that weak signal in the mismatch? A proper match will insure the best operation from your converter, and thus those weak DX openings can be turned into QSL cards rather than a station you were unable to identify. Whether you operate on 50, 144, or 220 Mc you can be sure of a uniform match over these bands without any tuned circuits.

Two of these small coils less than 2" long and ¼" in diameter will clean up your shack by replacing feet of Co-ax with a small 4 to 1 impedance matching transformer. Wound on threaded ceramic form.

CAT. NO.	Antenna	NET PRICE
6202	Matching Coil	$1.41

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YL's Frequency

[*from page 53*]

station. Loretta was one of the charter members of YLRL.

One of the early YLs in Texas was Ruth Brown at Electra. (See "YL's Frequency," *CQ*, October, 1946) For Ruth it all started in *1924* when her OM was 5AWQ and he and his brother were keeping the rest of the family awake into the wee small hours building gear. Soon she was licensed as second op under her OM's call. Interest lagged, but when her older son Ernie got the call W5FYZ, Ruth again got on the air as second op. Before WW 2 she got her own call, W5IZL. Ruth's OM is not well so her operating now is pretty much limited to twice weekly skeds with her son in Louisiana. Ruth mentions W5ZV, Margaret Bornemann, as another long-time W5 YL.

1925 saw 9CCN, Ada, on the air from Denver, Colo. (See "YL's Frequency," *CQ*, August, 1954). She was then only 11 years old and it was with her brother's persuasion that she learned the code and started in Ham radio. Ada Northrop is now on the air from Denver with the call WØRNO after having traveled all over the country and overseas with her Army officer husband. She operates on 40 CW only.

Congratulations to all of these YLs who have enjoyed Ham radio for thirty or more years! Undoubtedly there are other long-time YLs whom we have missed. If you are one, or if you know of any, let's hear from you.

Our sincere thanks to WØCO, Sumner B. (Ted) Young, for his help in locating early references to YLs through his Index to *QST*, Vol. I-V. And also to all of the YLs who so kindly supplied information and photos for this account.

33 till next month, W5RZJ

Labrador QSO Party

Time: 0001 Friday April 8 to 2400 Monday April 11.
Total operation to be restricted to **20 hours.**
All bands may be used and either phone or CW.
Multipliers: Less than 50 watts: 2
50 to 100 watts: 1.5
Over 100 watts: 1
Scoring: Multiply total contacts by sum of provinces, states and countries; multiply this by the power multiplier.
Contacts will consist of call sign, RST, Province, State or Country, date and time of the QSO.

Here is your chance to get yourself a VO2 or VO6 contact.

Send your scores to **Goose Bay Amateur Radio Club, Jack Willis, VO6N, c/o D.O.T., Goose Bay, Labrador.**

Propagation

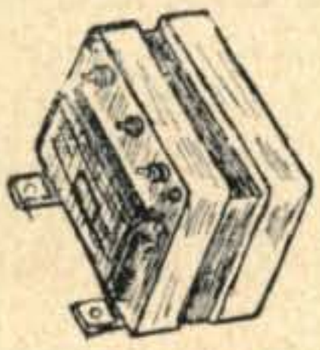
[*from page 35*]

wave propagation conditions a forecast for single hop or short-skip conditions on each band. The *skip effect* observed in short wave propagation will be discussed more completely in next month's column.

Anniversary

This month begins my fifth year as Shortwave Propagation Editor for *CQ Magazine*. I want to at this time thank all of you, who, during the past four years, have taken the time to drop me a line expressing your interest in shortwave radio propagation, and this column in particular. I also feel that special recognition is due *CQ Magazine* for recognizing the importance of propagation forecasts to radio amateurs and for being the only technical magazine in America presenting this information in a form usable for practical application by amateur radio operators.

IT'S V & H FOR VERY HOT BUYS IN ELECTRONICS



GOING HI POWER? THIS IS IT! 1 KW. POWER TRANSFORMER

OUTPUT: 2350-0-2350 VAC, 350 MILS. PRIMARY 110 VAC 60 CYCLES

Size: 8" high x 7" deep x 9" wide. NEW, IN ORIGINAL CRATE. ONLY..... **$22.50**

NOBODY—BUT NOBODY!— BEATS V. & H. ON TUBES!

NOTE: These tubes are not re-branded or seconds! ALL TUBES are standard brands, individually boxed and guaranteed to operate! Stock up now!

INDIVIDUAL TUBE SPECIALS!

1P30	$ .59	RKR-72	$ 1.00	805	$2.25
1R5	.60	RKR-73	1.00	809	1.50
1S5	.55	VT127A	1.95	811	2.75
1T4	.45	211/VT4C	.75	826	.45
2C39	7.50	249B	3.00	829	5.00
2C39A	12.00	250TL	7.50	829B	8.95
2C40	9.00	274B	1.50	832	4.00
2C43	10.00	316A	.35	832A	6.95
2D21	1.00	403B/6AK5W	2.50	836	2.00
3D22	7.50	417A/5842	11.00	872A	1.65
3E29	7.95	417A(Klyst)	5.00	954	.20
4-65A	15.00	446A	.75	955	.30
4C36	30.00	446B	.95	956	.30
4D32	22.50	464A	1.50	957	.35
4X150A	27.50	471A	1.50	958A	.50
4X500A	70.00	705A	.50	1625	.25
5U4G	.40	717A	.85	1629	.20
5Y3GT	.45	723A/B	10.00	2050	1.00
6AS7G	3.00	724B	.95	2051	.75
6C21	12.50	800	.75	5691	3.00
RX21	7.50	801A	.25	5692	5.50
35TG	4.00	803	2.50	5693	4.50

URANIUM HUNTERS! HEAR THIS!

GEIGER & SCINTILLATOR COUNTER TUBES AT TERRIFIC SAVINGS! WHAT DO YOU NEED???

POWER SUPPLY KITS

No. 1: 400-0-400 VAC @ 200 mils, 6.3 VCT @ 6 A, 5 V. @ 3 A TRANSFORMER 2-15 Hy 200 MA CHOKES, 1 elect. COND. 8x8x8 MFD 450 VDC **$7.95**

No. 2: 615-520-40-0-520-615 VAC @ 250 MA TRANSFORMER 15 Hy 200 MA CHOKE. 8-40 Hy 200 MA CHOKE. OIL CONDENSER 8x8x4 MFD. @ 650 VDC. **Special** **$10.95**

No. 3: 2350-0-2350 @ 300 MA TRANSFORMER. 1-12 Hy 300 MA 80 ohm 5 Kv CHOKE. 1-8-25 Hy 80 ohm 5 Kv. CHOKE. 2x8 MFD 2500 VDC OIL CONDENSERS **$44.95**

NOTE: Send full amount with order. Unless otherwise specified, material shipped via RR Express, shipping costs COD. Californians add 3% sales tax. All items subject to prior sale. Minimum order $5.00.

VARIABLE VOLTAGE TRANSFORMER

POWERSTAT TYPE NO. 1126 NEW!

$33.95

Input 115 V. AC, 50/60 cycles Output voltage 0-135 volts AC. Maximum amps output, 15 amps. 2 KVA. Overall size 8-3/16" x 8-1/16". Complete with knob and scale. Send 30% deposit with order. Open accounts to rated firms.

VARIAC NO. 200-C

7.5 A. MAXIMUM 0-130 V.A.C. 60 cyc. OUTPUT Excellent cond. With pointer knob and scale. **$14.95**

PACKAGE TUBE SPECIALS

RECEIVING TUBES

NOTE: Each package contains 10 tubes. Buy in quantity! Save in quantity!

10-5U4G	**$4.00**	10-6H6	$2.50	10-6SN7GT	$6.00
10-6AC7	6.00	10-6J6	3.50	10-6V6GT	5.50
10-6AG5	3.50	10-6SF5	5.50	10-12AT7	5.50
10-6AG7	9.50	10-6SJ7	2.50	10-12SL7GT	6.50
10—6AK5	4.00	10-6SL7GT	5.50	10-12SN7GT	6.50

FOR INDIVIDUAL PURCHASES: ADD 10¢ PER TUBE.

CATHODE RAY TUBE SPECIALS

3EP1	$ .89	5CP1	$1.45	5JP1	$14.95
3FP7	.89	5FP7	.89	5NP1	10.95
3DP1-S2	4.89	5FP14	1.45	7CP1	4.89
5AP1	2.75	5GP1	1.45	9LP7	4.89
5BP1	1.45	5HP1	1.45	12DP7	8.89
				12GP7	8.89

DUAL GUN "CRT" CATHODE RAY TUBE

Types: 52HAP7 & K1069P7. Cost Govt. $160.00. Tested! Guar! Only **$8.89**

50 W. MODULATION KIT

Consists of: INPUT TRANSFORMER Class "A" Plate (6J5) to Class "B" Grids. MODULATION TRANSFORMER for push-pull parallel 6L6 (3500 ohms) to 2,000 ohm RF load using parallel 807's **$5.95**

TRANSCEIVER-TRANSMITTER SPECIALS

APS-13 TRANSCEIVER. New in original carton $14.95
ARC-4 VHF TRANSCEIVER. Less dynamotor. Used 16.95
APN-1 TRANSCEIVER. Used. With tubes & wobulator 8.95
ARC-5 VHF TRANSMITTER. With tubes & crystals. Used 9.95

400 V. POWER TRANSFORMER: 800 VCT @ 200 MA. 6.3 VCT @ 6 A. 5 V. @ 3 A. Dim.: 4⅝ x 3¾ x 3½" in standard commercial case. Fully shielded. Pri: 110 VAC 60 cy. New..... **$3.95**

V & H RADIO AND ELECTRONICS SUPPLY Dept. Q-1

2029-2047 W. VENICE BLVD. · LOS ANGELES 6, CALIF. · REpublic 0215

APS-13 TRANS—REC. LIKE NEW
COMPLETE WITH 17 TUBES DYN. ETC. WT. 16 LBS. **$13.95**

REMOTE CONTROL BOXES
HAS MIC. & PHONE JACKS, 5 POS. SW, VOL. CONT. 4⅛x3¼x2¼ D NEW! 79c EA OR 10/$4.95
SHIPPED POSTPAID ANYWHERE IN USA

HANDY-TALKIE—BC-611F. Late Model—Like New $69.50

12V DYNAMOTOR — DM-35
Output: 625V.—.225A EX. COND. — Complete. WT. 11 LBS. **$19.95**

MOBILE GENERATOR - ALTERNATOR
OUTPUT: 115V—600 to 800 cy—1 kw 12 or 24 V D.C. at 25A

DELIVERS FULL POWER AT 1800 TO 4200 R.P.M. HAS BUILT-IN SPEED CONTROL. WT. 62 LBS. EX. COND. $9.95

Order Info: Send check for full amount. Freight or express charges c.o.d. Cal. customers add 3%.

AVIONIC SUPPLY 1223 VENICE BLVD. LOS ANGELES 6, CAL.

MAKE WAY! This boy's in bad shape!

Too bad the Ham who owned this receiver didn't get in touch with ALLIED before his ol' inhaler broke down. We'd have offered him an out-of-this-world trade-in allowance on a spanking new receiver. One moment, OM—a flash from the hospital! What's that, Doc?... the ol' inhaler's given up the ghost . . . catalepsy of the capacitors, rheumatiz of the resistors, dysentery of the dials, bursitis of the band-switch, cirrhosis of the shields, filariasis of the filters? Tch, tch, a pity . . . such a nice old receiver. Well, as we were saying, it's too bad it wasn't traded before it was too late. If **your** old receiver is creaking at the joints and can't seem to stand the gaff of present-day QRM and wearying contest sessions, it'll pay you to drop a card to our Communications Equipment Division. Tell us the model number of the receiver you want and the receiver you'd like to trade — you'll be surprised at our terrific trade-in offer. By the way, if you don't have our latest 308 page 1955 Catalog, we'd sure like to send you a copy. Write Allied Radio Corp., 100 N. Western Ave., Dept. 16-C-5, Chicago 80, Ill.

STAY ON THE AIR!

BEAT TVI

with the amazing, NEW

• • • AMECO LOW PASS FILTER

The AMECO low pass filter prevents the radiation of all spurious signals above 40 Mc. from the transmitter. The filter uses a Constant K Circuit, and is designed for Coaxial cable (52 to 72 ohms).

OTHER FEATURES INCLUDE: • Negligible Insertion Loss • 35 Db and more attenuation of harmonic and spurious frequencies above 50 Mc • Will handle up to 200 watts of RF power • Each unit complete with bracket, and instructions.

At the amazingly LOW, LOW price of **$1.95** Amateur net

Available at leading Ham equipment disributors, or write

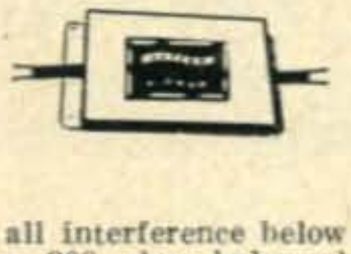
AMERICAN ELECTRONICS CO.

1203F Bryant Ave. (Dept. C3) New York 59, N. Y.

LO-PASS FILTERS HI-PASS

Eliminate TVI

Prevents radiation of spurious signals over 40 mc. Designed for 52-72 ohm coax. Negligible insertion loss. Over 40 db. attenuation. Handles above 200 watts RF power. Complete **$1.50** POST PAID



Cuts out all interference below 40 mc on 300 ohm balanced line. Signals over 54 mc pass through filter without loss. **Completely shielded in metal can.** Complete, full instructions **98¢** POST PAID

Send check or money order. (Both for $2.25)

Complete line of more than 75 filters and wavetraps. Send for free literature. Money back guarantee.

CAPCON, INC. 25C WILLETT ST. NEW YORK 2, N.Y.

SCRATCHI

[*from page 8*]

lowing me, buzzing jeep, squeaking and squeaking. Sum are catching up to jeep and roosting on foney rig. What a mess, Hon. Ed. Bats all over jeep. Big clowds of bats circling over jeep, and all time making squeaking noise like mousie caught in mousie-trap. It are unnerving, that what it are, Hon. Ed.

Finally get out far enufs, and stop the jeep. Pull rig off back of jeep after slapping cupple hundred bats off rig, leeving rig on ground, and doing old army manuveer known as "getting heck out of there." Wowiee!! You never seeing Scratchi so glad as when I looking back and seeing all those bats staying with Hon. Foney Rig.

So, Hon. Ed., it you heering week signal in 40 meters band which are modulated but nobuddies talking, it prolly are Scratchi's new foney rig. Only wun problem. What happening when that battery running down—where those bats going then?? I'll letting you know if finding out.

Respectively yours,

Hashafisti Scratchi

Late FCC Announcement

The FCC has announced that it will accept comments from all interested parties on the subject of expanding the forty meter Novice band from its present 7175-7200 kc. to a fifty kilocycle wide band, 7150-7200 kc. Comments should consist of an original and four copies which must be received before April 15, 1955. Refer to Proposed Rule Making 12.23 (E) (2) (ii).

NOVICE SHACK

[*from page 44*]

S.C., writes from one of the "rare" states east of the Mississippi, "I am using a BC-696 on 80 meters driven to 75 watts with a 6L6 rig, which I use alone on 40 meters, where it runs 20 watts input. Also, I have just completed a new 75-watt rig for 15 meters.

"My receivers are a BC-454 and a BC-455. When I feed them through a broadcast receiver, it improves their selectivity very much. I have ½-wave antennas for 40- and 80-meters and a fixed beam for 15 meters.

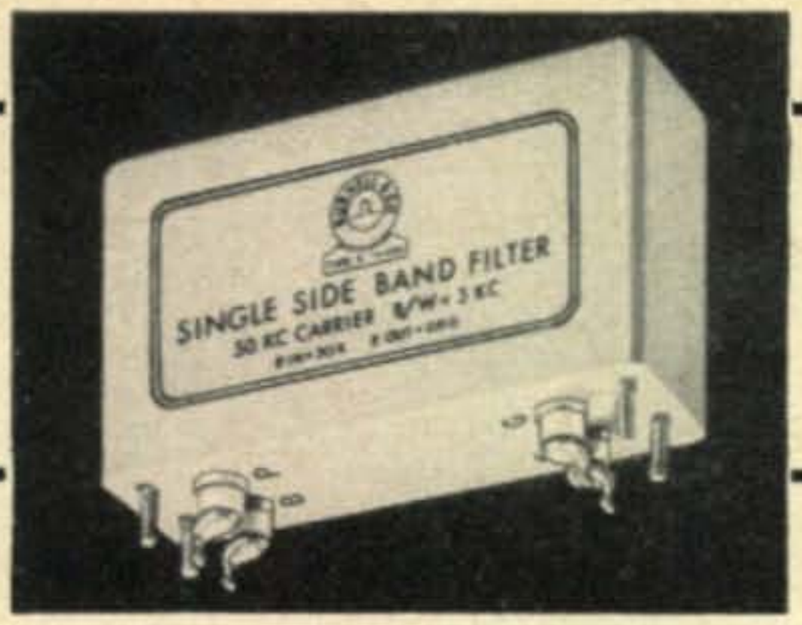
"DX here is not much, California and Washington and VE2, VE3. My states-worked total now stands at 35 confirmed. I hope to pick up a a few more on 15 meters. I am on the air every day, usually at night or in the late evening. I'll be glad to work anyone needing South Carolina. 73."

Gus Lanata, WN5IYZ, 1938 St. Roch Ave., New Orleans, La., "I would like very much to arrange schedules with stations in Los Angeles, Calif., or in Mount Clemens, Michigan. I would like them to handle traffic (messages) to either place for me.

"I have an AT-1 transmitter, a BC-342 receiver, and a Windom antenna.

"I'll answer all letters received. 73."

[*Continued on page 62*]



NOW! SSB
at a new low cost*

4" long x 1-3/8" wide, 2-3/16" high

with the **BURNELL** *S-15000 single side band filter*

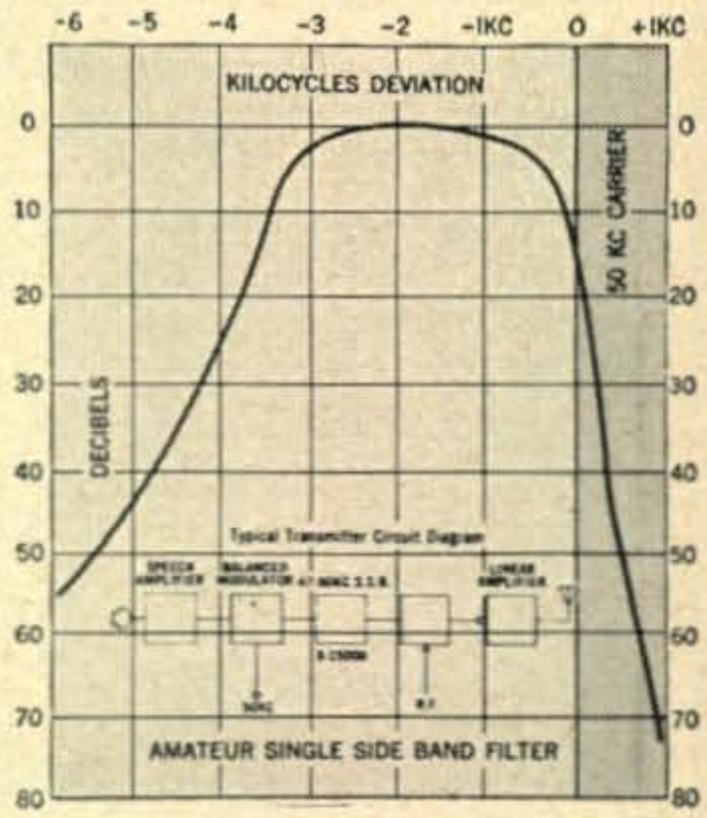
Modest budgets no longer stand in the way of single side band advantages. Not with the new BURNELL S-15000 filter. This *low cost* filter can be adapted to commercial or ham receivers or transmitters!

Although the S-15000 is made with the same commercial quality toroids and condensers as employed in the regular BURNELL Commercial Grade Audio Filters, it is designed for low budget application.

Also available: a new low cost *upper single side band* filter, S-16000.

Write Dept. K for our new booklet "Low Cost Single Side Band for Amateur and Commercial Equipment" and order your SSB FILTER now.

***PRICE $35.00 Net, plus postage**
Price on quantity quoted upon request.



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PACIFIC DIVISION: 720 Mission St., South Pasadena, Calif.

ORIGINAL VAARO MOBILE PRODUCTS
NOW MADE BY DAVIS ELECTRONICS

Vaaro Electronic Engineering Co., Long Beach, California has been purchased by Davis Electronics, Burbank, California. Throughout the television years, DAVIS ELECTRONICS has been known for their integrity and the high quality of the DAVIS "SUPER-VISION" TV ANTENNA LINE. Now, in addition to VAARO excellence of design facilities, DAVIS ELECTRONICS is providing top manufacturing facilities so you are assured of top quality performance, prompt delivery and fair pricing.

ORIGINAL VARIABLE SINGLE UNIT COIL
For 75-40-20-15-11 and 10 METER BANDS.
NOW IN THE 1955 DESIGN with the NEW, IMPROVED "DUAL CONTACT" between the coil windings to provide a greater, more positive, more efficient contact. Coil can be INSTANTLY TUNED to ANY DESIRED BAND or FREQUENCY by ingenious locking device. Factory pretuned. Continuous coverage from 3750 kcs. to 30,000 kcs. Highest "Q" available. Fits all whips and bases.

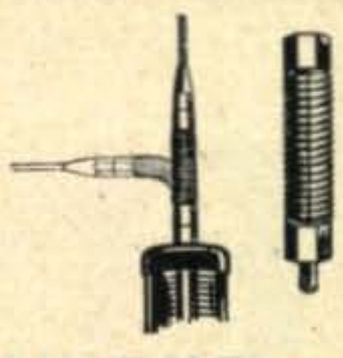
MODEL V-102B—for 0 to 500 watts input
$14.95

MODEL V-103B—for 0 to 1000 watts input
$16.95

VAARO BUMPER MOUNT Eliminates cutting holes in your car. Fits any antenna and car bumper. BUMPER CURVATURE INSERT exactly fits your make and model of car. Socket dimensions: Standard 3/8" x 24 thread. Has .500 thick fibreglas disc of top dielectric material. MODEL V-105. Cast aluminum. Hammertone baked enamel, **$13.95**

MODEL V-105V. Guaranteed 5 years against corrosion and flaking. Cast bronze. Heavy chrome and copper underplating, **$25.95**

VAARO "WHIP FLEXOR" keeps whip perpendicular at high speeds—thus no change in loading or impairment of reception. Cuts down bad "QSB" action on receiving end. Whip can be brought into horizontal plane for car storage, etc. Has strong cadmium-plated square steel wire spring. Only **$3.95**



The DAVIS-VAARO Line also includes: FIBREGLAS WHIPS—6' **$8.50**, 7' **$8.75**, and 8' **$8.95**. Also BASE SECTIONS (Solid Hex); 12" **$3.75**. 24" **$3.95**. 36" **$4.95**.

VAARO "WHIP CLAMP" — Securely fastens to roof water-drain of any car without damage to finish. Fastens whip securely down to car roof level for storage, low wooded areas, etc. Solid brass, chrome plated. Installed in 30 seconds. **$1.79**

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SIRS: RUSH INFORMATION TO ME AS CHECKED:
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☐ Send Address of **NEAREST AMATEUR JOBBER.**

Name_____
Street_____
City_____ State_____

[from page 60]

More News

Stan Dickhaut, WN8TXT, Huron, Ohio, writes, "I have been a shortwave listener (SWL) since 1935. And after help from Waldo, W8ANO, and Bill, W8EDE, I made my Novice. Got my ticket November first. I am in your youngster class—age 57. Never thought I'd like code, but find it fascinating. Hope to improve my code ability and theory so I can qualify for my General Class license. My rig is a Viking-II and my receiver is a *Collins* 51J-4, with a Windom antenna. Considering a ½-wave doublet. Listen for me on 3702 Kc. 73."

K. J. Farnsworth, WN7WLV, 3708 S. 23rd, East, Salt Lake City, Utah, reports, "Just a line to let you know what a response I got to my letter, which you printed in the *Novice Shack*. Have received many letters from the eastern states from fellows wanting to make a Utah contact. It seems Utah is a rare one back there.

"I am on the air each evening between 6:00 p.m. and 10:00 p.m., MST, and I will be happy to make a contact with anyone. I have, however, answered many CQ's from Novices in the east, but no go. If all operators would listen to the weaker signals after a CQ, we would all work more rare ones. I can hear them, and I am sure they could hear me, if they would listen more carefully. Another thing that will help is for us to send our call letters more carefully. A long way off, your call is a little strange compared to the normal signals.

"I have now worked 41 states. 73."

Nancy Townsend, KN2JIR (15), Rice Road, East Aurora, New York, gets right to the point, "Doesn't anyone ever write from New York or New Jersey? I have had my ticket for about three months. My Mom, K2DSN, and I run a Viking II and an HQ-129X, with a Windom antenna.

"So far, my DX is the state of Washington. I'd give anything to work California. I hear '6's' often enough, but I guess they just don't hear me. I have about 36 states and Canada, all worked on 3717 Kc. and 3740 Kc. I find the best time for DX is around 11:00 p.m. and 4:00 a.m.

"Right now, I am studying for my General, but I find the theory darn tough! If only there were not those schematics.

"I sure do have a lot of fun, and I guess Ham radio is about the most interesting hobby one can have. 73."

Carl C. Drumeller, W5EHC, Secretary-Treasurer of the Aeronautical Center Amateur Radio Club, Box 1082, Oklahoma City 1, Oklahoma, writes, "You might be interested in what this club is doing for Novices (not only our associated Novices, but all of them). We maintain a Novice crystal bank, with both 3.7- and 7.175-Mc crystals in it, donated a *National* receiver to the Novice club of a local junior high school, and publish a number of operating aids. I am sending you samples of these. If Novices desire copies, they will be sent free upon the receipt of a large, addressed envelope, complete with six cents of postage. 73."

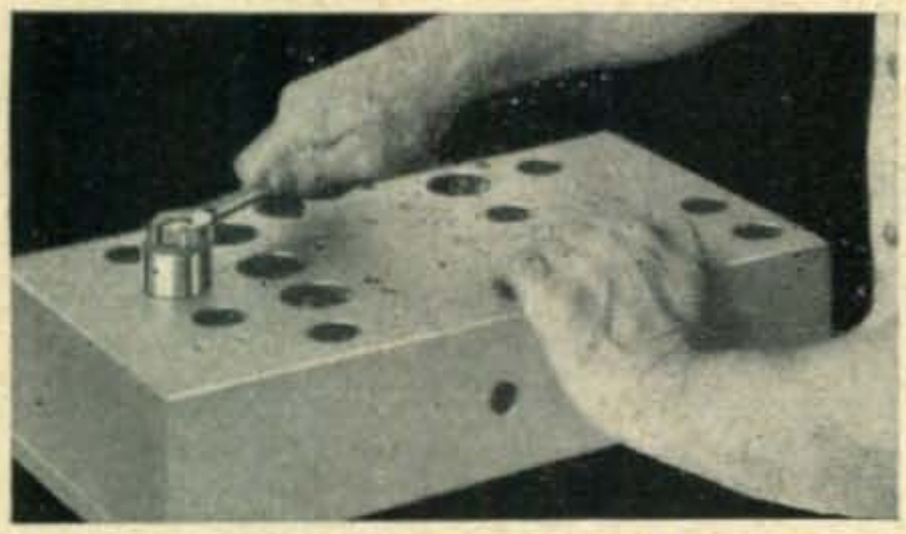
The operating aids Carl sent include a nine-page manual of radiotelegraph operating procedures, and individual sheets on the amateur message form, phonetic alphabets, and radiophone procedure signals. They are well worth sending a stamped, addressed envelope to obtain. Send your request to the Aeronautical Center Radio Club, not to me.

Don Pfohl, KN6HWI, 630 Olmstead St., San Francisco 24, Calif., gets our last bit of space this month. He writes, "Just a word about 80 meters out this way. My rig is a 6AG7-6L6, running about 30 watts, and the receiver is an SX-28. My antennas are ½-wave folded dipoles. Novice DX has been pretty good here late at night. With my 30 watts, I have worked Florida, So. Carolina, Ohio, Indiana, Illinois, Minnesota, Missouri, a couple of Canadians and Alaska. So don't give up on 80 meters. Patience will pay off.

"If anyone wants a sked just to ragechew or to give him a new state. 73. P.S. Just passed my General exam today!"

Until next month, when I hope to print news about you, 73—Herb.

SAVE HOURS OF WORK



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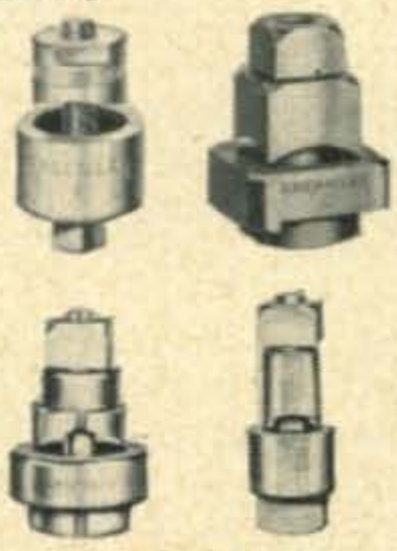

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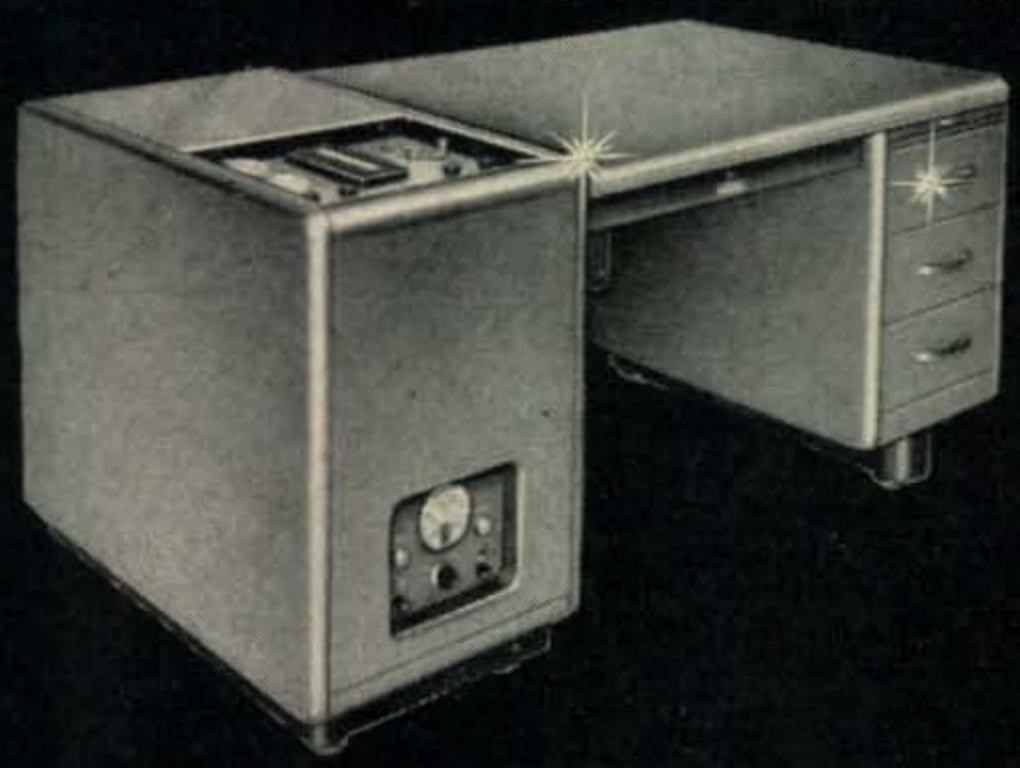

1000 Watts Continuous Wave
1000 Watts Amplitude Modulated Phone
1000 Watts Single Sideband

Truly a "dream kilowatt", this magnificent Viking is unequalled in performance . . . unmatched in appearance and operating ease. You'll immediately sense the surge of authority in its full kilowatt signal, and just the flip of a single switch lets you select high or low power SSB, AM or CW. You'll enjoy the convenience, too, of its desk top controls and you'll appreciate its bold, modern styling that fits so well with any decor. Yes, the world at your finger tips—for this Viking Kilowatt can be yours at an unbelievably low price. Write for your copy of the deluxe brochure giving the complete inside story today!

Available as a self-contained pedestal type unit or with the matching executive type desk top and three drawer pedestal.

Cat. No. 240-1000 Viking Kilowatt Power Amplifier—wired, tested, complete with tubes ..... **$1595.00** Amateur Net

Cat. No. 251-101-1 Matching Accessory Desk Top and three drawer pedestal ..... **$123.50** FOB Corry, Pa.

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DX and OVERSEAS NEWS

[*from page 38*]

W3RGQ, says that PY1AJ has been heard by several but not worked (Guess it's that PY summer QRN!). OD5LX has been heard in England, 589, working three ZC4 stations. HR1LW has crystals for 1862 and 1890 while YU1GM has one for 1870. As last year, it seems as the Winter advances the path from Europe tends to shift from west to southwest.

DX'ploits

Top-man W1FH adds KC4AB for No. 259 while Bob, W3GHD goes to 247 with such as HKØAI, FO8AJ and KC4AB. . . . HKØAI moves W6GDJ to 236 as KC4AB lifted W6VE to 232. . . . Alf, VK3KB, rises to 207 with new list and W6ID rests on 155 thanks to KC4AB and VR1RO. . . . Glenn, W8KIA, hits 242 with FG7XB and W5ASG follows closely with ZA1BB for 241. . . . Al, W2WZ, ups to 239 with Navassa as Stan, W1CLX, also nabbed him for 235. . . . Norm, W1HX, rises to 224 with HKØHQ, KC4AB, VK1AC and VR1RO while Ray, W2BJ, marks time on 216 with ZA1BB, CEØAD and KC4AB. . . . Chas, W3DKT, rests on 212 with HKØAI and CEØAA under his belt as KP4KD goes to 210 with a re-added VO1S. . . . W1ZL keyed with KC4AB for No. 206 and Clif, WØAZT, submits new list which moves him from 38-143 to 39-180. . . . 213 is the number at W1HA thanks to VQ6LQ, KC6CG, ET3LF, ZD3GS, OY2Z, HKØAI and KC4AB. . . . At W5KUJ Charlie pulled in HKØAI, KC4AB, VP8AQ and VP8BE for a 191 total while Pat, W2GVZ, keyed with ZA1BB and DU7SV to reach 184. . . . Rip, W4EPA, swapped reports with KC4AB, HB1MX/HE, FB8BR and DU7SV for a 170 score while W9WCE rests on 156 with ZD6BX and KC4AB. . . . Dixie, W2ZVS, makes it 171 with help from KC4AB while Mickey, W8YIN, enters the Honor Roll thanks to FB8BR in zone 39. . . . Jim, W5FXN, is now 173 with ZC4JA and W6HJ reaches 121 with KC6ZB, HKØAI, ZD6BX, VP8AQ and KC4AB. . . . Don, W6AM, boosts his phone total to 179 with VK9RH, FY7WE and VP5AE while Ernie, W6KQY, miked with VK1HM/ZC2, KC4AB, VQ6LQ, VS4HK, VP5AE and YU1AD for a 178 phone total. . . . Harry, WØANF, A3'd to 144 with KC4AB and then, with new 90 foot high beam, switched to CW for FB8BR, EAØAR, VK1EG, SP9KAD, FQ8AX, EA9DF and other morsels. . . . W3GHD hit 184 with FO8AJ and CR7AF. . . . Hal, VE3IG, broke the century mark by snagging FG7XB on 3.5. It was Hals No. 53 on that band. . . . Fred, W2TVR, aided by 500 watts and a short beam nabbed such as

[*Continued on page 66*]

Photographs

We think it is always interesting to see what the other guy and the other guys station looks like. To this end we invite you to ship us a photo along with a brief station description. While photos of rare DX stations are preferred don't hesitate to send yours in and we will do our darndest to have it appear in this column at some time or other. Prints should be reasonably clear. Thanks!

HAMFEST

The Bremerton Amateur Radio Association will hold a hamfest on March 5 at the Elks Temple, Fifth and Pacific, Bremerton, Washington. Registration at 1 P.M., banquet at 7 P.M. . . . chicken dinner, country style. Price only $4.00 per person. Lots of free prizes. Tickets: Allen R. Nelson, W7GUS, Box 103, Port Orchard, Washington.

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by Jack N. Brown, W3SHY

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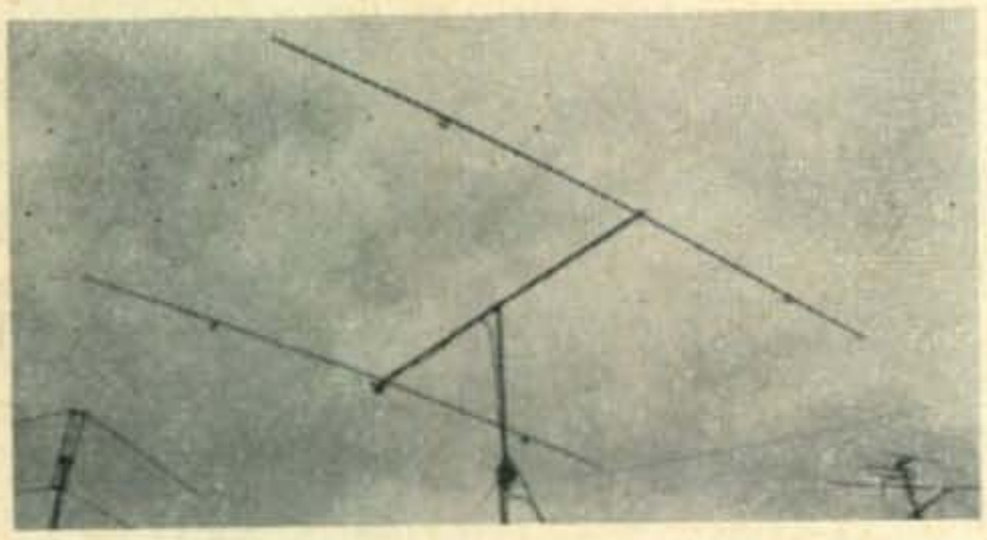

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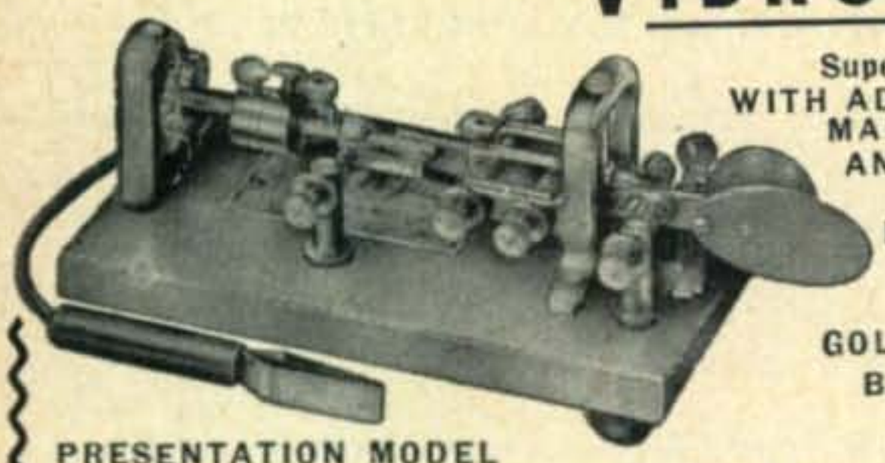

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[from page 64]

3V8AN, HE9LAA, VK1AC, ET3LF, FB8BE, JAØCA, EH3S, I5PP, CR7LU, VR1A, VQ6LQ, CR5JB, ZD6BX and ZA1BB. . . . Dick, W6TKX, pulled in UC2KAB, JZØDN and CT1DJ. Dick says the Russian "WSEM" is the equivalent of our CQ, is pronounced VESEM, and means "Anyone"! . . . Gene, W7VY, nabbed VK1HM/ZC2 for No. 248. . . . W6KSF added FG7XB. . . . Pat, VK4YP, was VR1RO's first contact from Ocean Island. . . . Clet, WIDIT, upped to 149 with ET3S and HKØAI. . . . W3MFW nabbed OY7ML. . . . W8JGU rose to 158 with UB5KBE, CR5JB, ET3S and ZA1BB. . . . W6KYG went to 205 with VR3A. . . . DL1QT was happy to raise FG7XB. . . . W5VIR went to 79 on 21 Mc. with VP8AQ, DU7SV, KA2KS and EL2X. . . . W8BKP made it 227 with SV1AZ, VR1RO and LB1BF

New DX Addresses

CN8EB——Via W3WDI R.D. 2 Box 171 Uniontown, Pa.
CN8FL——Via W8FGX.
CN8HX——Frank Murray, W1IRE, 29 Ferry St. Boston, Mass.
CN8IE——Pete Nissen, WØLRP, NAF, Box 8, Navy 214, FPO, N.Y.
DL4AIR——MARS, 7100th Support Wing, USAFE, APO 633, PM, N.Y.
ET3LF——Box 114, Addis Ababa, Ethiopia.
ET3Q——P.O. Box 1636, Addis Ababa, Ethiopia.
FB8BR——Hubert, Direction Aviation Civile, B.P. 730, Tananarive, Madagascar.
HA5KBA——Bandi, Endre Bodonyi, XI. Kende-U.14, Budapest, Hungary.
HZ2AEH——APO 616, PM, N.Y.
KA2GC——SFC G. Clineman RA42160184, Sig. OPNS. Co. 8060 A.U. APO 343 P.M. S.F.
KA2RR——C.H.A. Rohr, USN, Staff, CWPA, Navy 3923, Box 73 FPO, S.F. Calif.
KR6OY——Via W7UMH.
KZ5DM——Mac, Box 813, Balboa, C.Z.
M1L/M1B——Box 8, San Marino.
ex-MP4BBD——Roy Fleming, Caltex Inc., Ref. Div., P.O. Box 783, Manila, P.I.
OE13USA——Mac, Salzburg Signal Office, QSL OE13, APO 541, P.M. N.Y.
OK1HI——Josef Hyska, Cechova 31, Praha XIX, Czechoslovakia.
OQ5HI——P.O. Box 634, Elisabethville, Belgian Congo.
OX3WW——Poul Anderson, Narssak, Greenland.
ST2GB——Sgt. John Elliot, RAF, Khartoum, Sudan.
SV1AZ/Crete——Box 15, Candia, Crete.
TG9EA——P.O. Box 115, Guatemala City, Guatemala.
TI2RI——P.O. Box 2118, San Jose, Costa Rica.
VE8ML——Via VE8 Bureau.
VK1EG——Via VK2EG.
VO6AB——Ted, Via D.O.T. Goosebay, Labrador.
VP6GC——Gordon Corbin, Westbury Road, St. Michael, Barbados, B.W.I.
VP7NW——W. L. Brown, 1227 Huntingdon Road, Winston-Salem, N.C.
VP7NY——Clive, Edgar Cove, Grand Bahama, B.W.I.
VQ3HJP——H. J. Powell, Mafia Island, Via Tanganyika, Africa.
W1KGH/VE8——Via W1 Bureau.
YN1PM——Paul, Box 346, Managua, Nicaragua.
ZB1AH——(Now home) 23 Hilltop Crescent, Wheatley Hills, Yorks, England.
ZB1AJX——George Stanton, Mifaud Flats, New North South St, Paceville, Malta.
ZD4EQ——John, P.O. Box 109, Tarkwa, Gold Coast.
ZP5BC——Nasario Ledesma M., P.O. Box 133, Asuncion, Paraguay.
ZS3AH——Jack Swart, Post Office, Okahandja, Southwest Africa.
5A4TU——Dane Willaford, Box 372, Tripoli, Libya.
5A4TX——Box 372, Tripoli, Libya.

Thanks to the North California DX Bulletin, West Gulf DX Bulletin, CN8EI, K2GFQ, W4BQY, W9EU and W3TPC.

Here and There

A **"ZL3JX Pig Barbecue"** was thoroughly enjoyed by members of the CZARA and their families on January 8th at the Qth of **KZ5ML/KZ5FL.** The porker was sent by ZL3JX in reciprocation for kind treatment received from his many KZ5 friends. . . . Nice to see Tom, **W5MIS,** on again after a stiff bout with Channel 2 from Tulsa. . . . KV4AA logged visits from **W5LV/MM** and **W1CLI.** . . . **HKØAI's** mail leaves every fifteen days. . . . Cal, **W4ANE,** moves back to Columbus, Ga, where he will be heard as W4MLO. . . . **W2RDK** moves from Levittown, L.I. and starts afresh in Columbus, Ohio. . . . VP2KB is now the owner of **VE3DJV.** . . . Steve, **W1AQE,** changed QTH's from Waltham to New Bedford. . . . Carl, W1MIJ, is now in charge at **W9MUB,** Chicago. . . . **W4KWY** sports a three element beam on 7 Mc., a six element beam on 14 and tapers off to five element arrays on 21 and 28 (lots of shade!). . . . W2UEI is now **W1DDF** near Boston. . . . Expected at the Fresno get-together were VK2US, W9IOP, WØBFY, W9YFV, TI2TG/K6INI, W5ENE and FO8AD. . . . ex-KV4AU now keys from **W4YID,** Blountville, Tenn. . . . **W4ML** seeks QSL from: YA2AB '48, MD7HV '49, ZC6WF '49, ZC1AZ '48, TA1AD '47 and VP5BF '49. . . .

Honor Roll Endorsements

(To Jan. 15th 1955)

W1FH	40-259	W1CLX	39-235	W4EPA	37-170
W5KUC	40-251	W1HX	39-224	W9WCE	37-156
W3GHD	40-247	W2BJ	39-216	W2ZVS	36-171
W6GDJ	40-236	W3DKT	39-212	W8YIN	35-176
W6VE	40-232	KP4KD	39-210	W5FXN	35-173
VK3KB	40-207	W1ZL	39-206	W6HJ	35-121
W6ID	40-155	WØAZT	39-180	PHONE	ONLY
W6DVB	40-104	W8UAS	38-215	W6AM	38-179
W8KIA	39-242	W1HA	38-213	W6KQY	38-178
W5ASG	39-241	W5KUJ	38-191	W3GHD	37-184
W2WZ	39-239	W2GVZ	38-184	WØANF	35-144

Last complete HONOR ROLL appeared in the January issue.

Next complete HONOR ROLL is due in the May issue.

New officers at the North Calif. DX Club are: **W6EJA** Pres., **W6KEK** V.P., **W6KEV** Sec'y-Treas., **W6MEK** and **W6LMZ** Directors. . . . Elections at the South Calif. DX Club resulted in: **W6MUR** Pres., **W6SYG** V.P., **W6FSJ** Sec'y., **W6CUQ** Treas. Congrats! . . . Rod Newkirk, our talented competitor at QST, has moved back to Chicago and may be heard with his old call of **W9BRD** (if he gets it back). All material for his column should be sent to 5833 North Kenmore Ave., Chicago 40, Ill. . . . Bob, **YU1GM,** wants it known he QSL's 100 pc. but has delays getting in new batches. . . . ZL4GA received QSL's from **VP1AA** and **UP1AA** both confirming QSO's at same time! ! . . . QSL Mgr. VK3RJ, handled a QSL going from **KF3AB,** North Pole, to **VK1AC,** Maquarie Island, South Pole (nearly). . . . W6AOA says that the mysterious **KD6AT** WILL count as a new country but cannot give QTH at present. QSL's will come through in Feb. or March. . . . CN8MM says **MP4QAD** is a new one in Qatar and is on from 1600 to 1800 GMT. Eva can help with skeds. . . . Here's a QTH we missed: **ET3GB,** Box 621, Addis Ababa—also—**ZP5GM,** c/o American Embassy, Asuncion, Paraguay. . . . We hear that Sam, **4X4BX,** ran up 611,000 points in the last CQ brawl. Whew! . . . **XE1SA** requests that we print the following regarding the Mexican 50P-50W award: 50 QSL cards **MUST** accompany the application. Contacts on 1.8, 27 and 750 Mc. are not valid for this award (XE stations may not use 1.8 Mc.). The LMRE is preparing a big contest which is due sometime between May and September. We'll let you know. Contacts with the Revillagigedo Islands, XE4, count as a new country for the 50P-50W award. XE1SA seeks the following QSL's: VQ2AB (aw Buggy!), CR6AI, KB6AK, KG6ADY, KX6BF, VP2GX, EL9A and FO8AC.

Vy 73 and DX, Dick

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FOR SALE: Following equipment for sale. All in excellent condition. No junk. Collins 32V2 xmtr; 2 separate Kw Xmtrs TVIed; Millen 90501 Secondary Standard; Browning P4E synchroscope; Hickok 1-177 tube tester; LM-15 freq. meter w/int. mod., orig. calib. bk., spare parts kit and orig. LM AC pwr supply; Espey I-126 sig. gen.—covers 15-25 mc. and 180-240 mc., w/Mod. in orig. hardwood case; 2 airborne radar sets APT-5. For details and prices (or would be interested in swapping for your tubes) Write: B. N. Gensler, W2LNI, 330 West 11th St., New York 14, N.Y.

JOHNSON Viking Matchbox antenna coupler. Used only about 50 hours, like new, $38. WØIHW, Nashwauk, Minn.

SURPLUS—RG-8/U cable, 100 ft., $5.95. 250 ft., $13.25. 500 ft., $25.00. Connectors—PL-259 or SO-239, 5 for $2.00. Postage extra. Free catalog. Lectronic Research, 717 Arch St., Philadelphia, Pa.

New tubes—pair 4-250A's $70, pair 803's $15. Used—pair 813's $15. Mobile—bumper antenna, coils $10; vibrator supply—300 volts, 100 ma, $10. Gray Bud cabinet—CR-1772 $35. Transmitting equipment with gray Bud panels: power supply—750 volts, 300 ma plus bias $50; 500-watt antenna tuner $25; new parts for kilowatt amplifier and power supply, 10¢ for photos and details plus list of test equipment, tubes and parts. Roy Gillett, W2PNG, 68 Hyde Boulevard, Ballston Spa, New York.

FOR SALE: VHF-152A, like new, $35. Cabinet 22" x 48", black crackle finish, $3. W5RZJ, Dulce, New Mexico.

GOING MOBILE OR HIGH FREQUENCY? A complete Gonset outfit for sale for cash. Deluxe two meter Communicator II (squelch), Super-Six Converter, Super-Ceiver, Gonset Commander Transmitter and V.F.O. All in "like new" condition. Take one, take all. W1KTJ, R. T. Graham, P.O. Box 23, Stoneham, Mass., St-6-1966.

FOR SALE: Halicrafters SX42 in perfect condition. Earl Bradford, Norway, Maine.

BC-221-AK original calib. bk. excellent condition $125. Four 12 mfd. 2 Kv. condensers, $6.00 each. J. Pyryt, 322 Ross Rd., Paramus, N.J.

SACRIFICE—Leece Neville, 5058-GA3, 6 volt, 100 amp., Alternator, regulator and rectifier. Used 6 months. Latest model. $60.00. (Not obsolete 5024-G3 Alternator). Herbert A. Zimmermann, Jr., 89 Clark St., Brooklyn 2, N.Y. ULster 2-6944.

SELL: RCA kilowatt modulation transformer. Separate winding for mod. screen. FOB, $25. W. Miller, Box 422, Kalamazoo, Mich.

VIKING II, like new. VFO, Matchbox, LP Filter, SWR Bridge, D104 Mike. FOB. First $300 takes it. DEE, 1341 Elmwood Avenue, Wilmette, Illinois.

VIKING II transmitter, Viking VFO, HQ-129X receiver with xtal calibrator and speaker, Astatic D-104 mike, antenna coupler, plug-in phone patch. All like new, perfect working condition, $465 complete. Will crate free. W4JUX, 102 Norton Rd., Oak Ridge, Tenn.

COLLINS 30K-1, with 310A driver, cannot be told from new, $975. Will take 32V-1, V-2, B&W 5100, or Viking in trade. Would consider other small commercial gear in trade also. W4LEP, Dan Edwards, 208 N. Fremont Avenue, Tampa, Fla.

SELL: Collins 310C-2 exciter. Provides 80v. 80 meter excitation from 70E-8 PTO and buffer; and power supply. Incorporates slide rule dial, with factory rewired remote switching relay arrangement, $110. John W. McNamara, Anamosa, Iowa.

REAL BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, Johnson, Elmac, Barker & Williamson, Gonset, Morrow, Babcock, RME, Harvey-Wells, Millen, Meissner, Lysco, Sonar, Central Electronics, all others. Reconditioned S40A, $69.00. S40B, $79.00. S76, $129.00. SX71, $159.00. NC57, $59.00. NC98, $119.00. NC125, $129.00. HRO50T, $269.00, HRO60, $389.00. SP400X, $259.00. HT20, $299.00. 32V1, $345.00. 32V2, $445.00. 75A2, 75A3, Viking I, Viking II, HT9, NC183D, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio, Butler, Missouri.

FOR SALE: KW transmitter, TCS transmitter, Variac, 6V Dynamotor, 20 M beam, tubes, meters, send for list. E. L. Felder, Tylertown, Miss.

FREE LIST! New and reconditioned receivers, transmitters, etc. One hundred big bargains every month. Highest trade-in allowance. Write today! Dossett, W9BHV, 855 Burlington, Frankfort, Indiana.

SELL: Lysco equipment, never used, Model #382 mobile vfo $28.00. #B129T mobile 10 M transmitter, $26.00. #50 ant. coupler, $11.00. #30 noise limiter, $8.00. #401 clampmaster, $16.00 and #912 marine radiotelephone, $160.00. W2BAY, P.O. Box 305, Haddonfield, N. J.

BUY surplus radio receivers, transmitters, etc, from government. List, $1.00. Box AT 169, East Hartford 8, Conn.

CRYSTALS: FT-243's—3500 to 8700 KC ± 2KC, $1.00 each, .01% setting, $2.00 each. Hundley Crystal Co., 2951 North 36th, Kansas City 4, Kansas.

FOR SALE: Have several brand new Eimac surplus 750-TL, power triodes in original sealed cartons at $30.00 each, prepaid in USA. Also have several basic component power supply kits containing 3500 volt pwr. xfmr @ 400 ma. Pri. 115 volts 60 cy. Also contains 400 ma. smoothing choke and bridge filament xfmr. Comes with instructions and 4 RCA 866-A's. Shipped prepaid in the USA. Only $45.00 complete. B. N. Gensler, W2LNI, 330 West 11th Street, New York 14, N. Y.

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SELL: Viking II, Viking VFO, Matchbox, Hallicrafters SX-88 with speaker, B&W Low-Pass, D-104 mike, Sonar phone patch, Vibroplex bug, Heathkit grid dipper, Millen bridge, Baluns, relays, 500 watt coils, antennas, coax, etc. Beautiful condition and functionally perfect. All sincere offers or inquiries welcomed and acknowledged. Gordon Crowe, WØIPG, 303 Brush Creek, Kansas City, Missouri. Phone LOgan 2426.

SELL: Teletype equipment, RBM dpdt relays, #241 Dumont scope, $275., TS 47, $175. APN-9, $225. NC-2-40D, $135. Boehme automatic keyer with McElroy 3-key perforator, $145. Collins 30-J, $375. Want APR-4, ART-13, BC-610 and parts, ARN-7, Technical manuals. Tom Howard, W-1-AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

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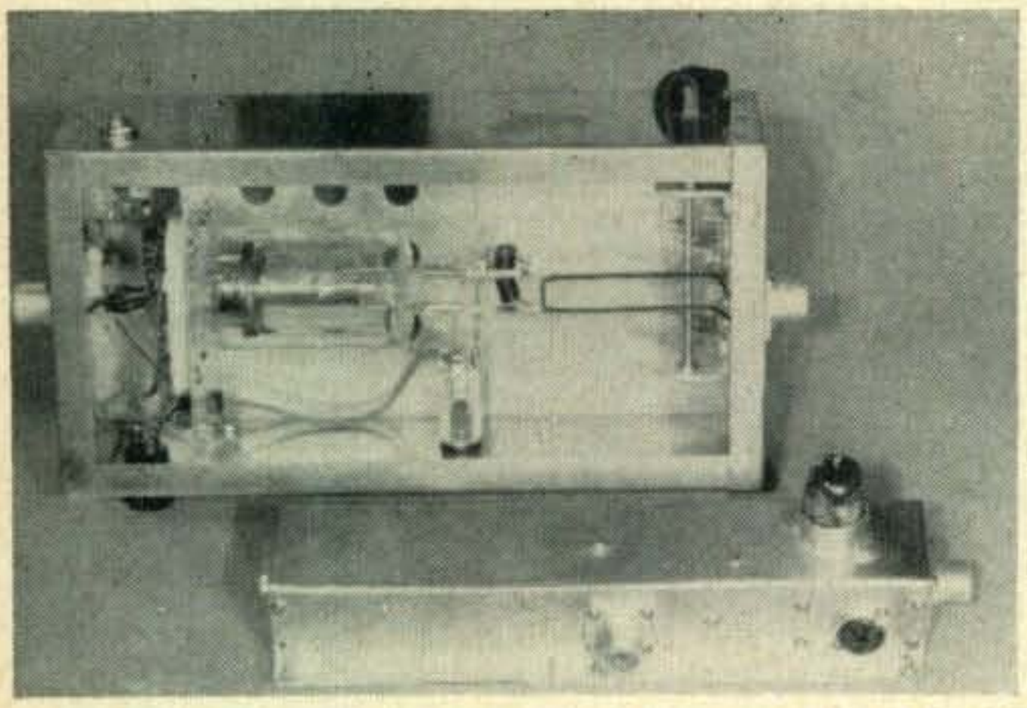

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WANTED to buy: Your surplus tubes, diode crystals and other electronic gear. Will pay cash and all shipping charges. For a fair deal, send your list to: B. N. Gensler, W2LNI, 330 West 11th Street, New York 14, N.Y.

WE WANT your used gear. Highest trade-in allowance on National, Hallicrafters, RME, Hammarlund, Gonset, Morrow, Johnson, etc. Write or call: C&G Radio Supply Company, 2502-6 Jefferson Avenue, Tacoma 2, Washington. Br. 3181.

AN/APR-4 receivers and tuning units urgently needed! Engineering Associates, 434 Patterson Road, Dayton 9, O.

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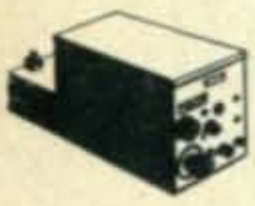

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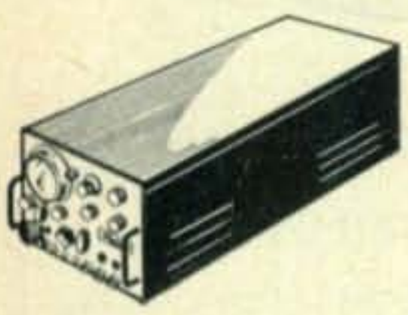

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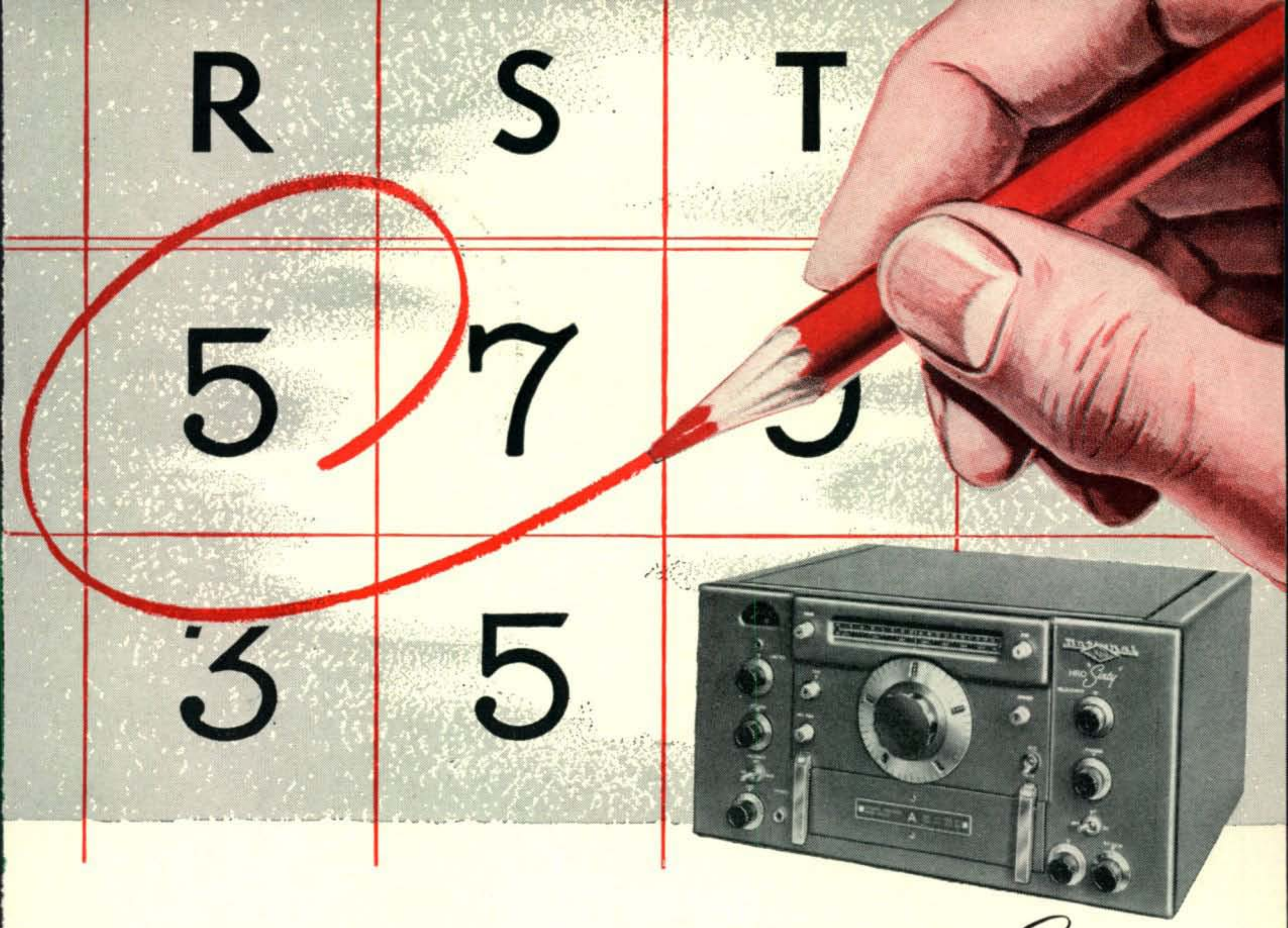

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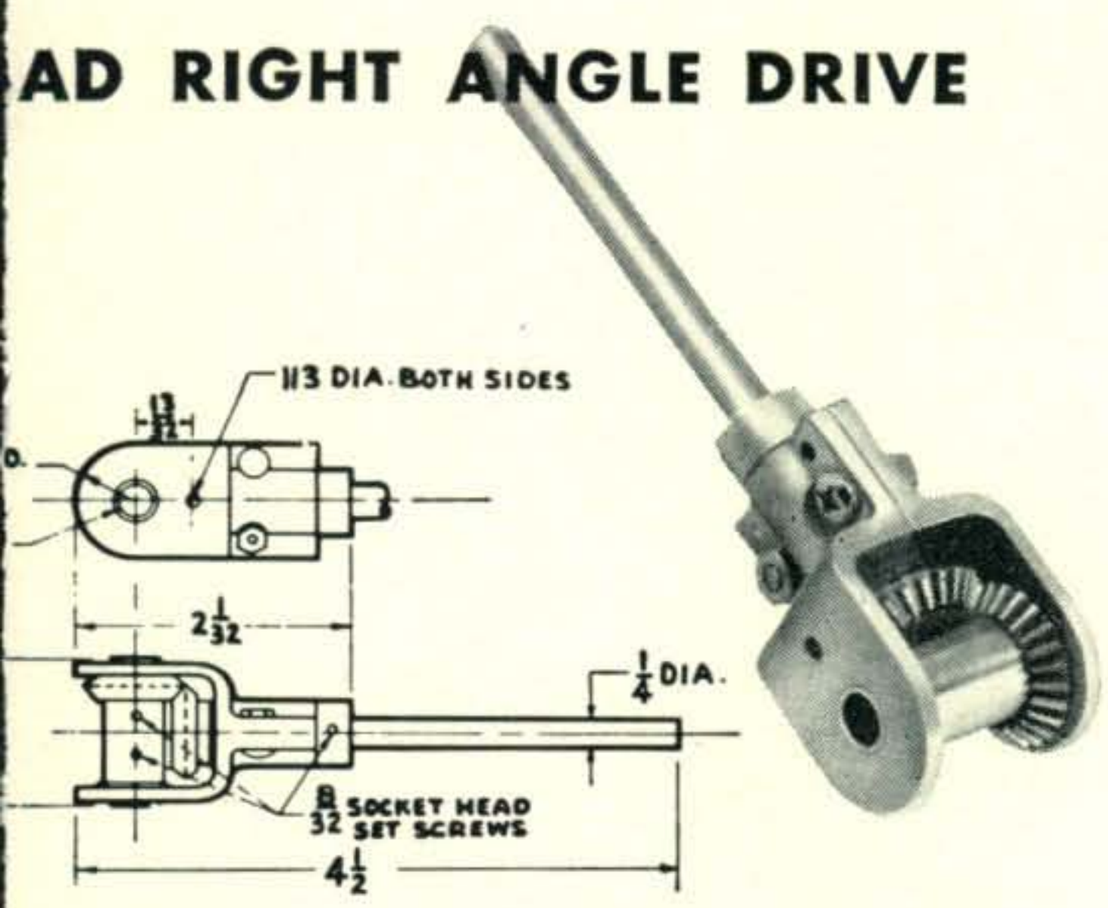

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